PHILIPPINE ISLANDS BUREAU OF FORESTRY

ANNUAL REPORT

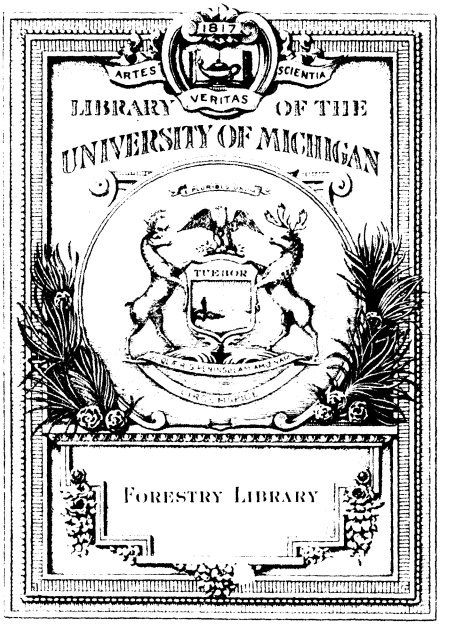
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THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF THE INTERIOR
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1915

W. F. SHERFESEE
Director of Forestry

MANILA
BUREAU OF PRINTING
1916

141947

Philippine Islands. Bureau of forestry.

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY.

MANILA, P. I., *March 1, 1916.*

SIR: In the absence of William Forsythe Sherfesee, Director of Forestry, I have the honor to submit herewith the annual report of the Bureau for the fiscal year 1915, covering the period from January 1 to December 31, 1915.

The Director of Forestry left Manila on January 12, 1916, on a leave of absence, which he will spend as a member of the Chinese Government, assisting in drawing up a national forest policy and putting it into execution. While in China, he holds the position of adviser in forestry to the Chinese Government and codirector of the Chinese forest service, Peking. The results discussed in this report were accomplished under his direction and the plans proposed for the new fiscal year are those which meet with his full approval.

PROPAGANDA.

The Bureau of Forestry, more than any other branch of the Philippine Government, depends on the coöperation of the provincial and municipal authorities and of the people themselves. The objects of conservation and the proper utilization of forest products are comparatively little known by the people of the Islands. Forest officers have been in the past mostly considered as men to be avoided, as that part of their duties which compels them to take action against illegal users of the forest and illegal caiñgin makers makes more impression on the people than their other work, which is not so well recognized. It is believed that a good many of the violations of the Forest Act are due not so much to intentional violations of the law, as to ignorance of its provisions. The Director, therefore, started early in the year a vigorous campaign for education and propaganda with the object of making the people of the Philippines well acquainted with the work of the Bureau of Forestry and its purposes. For this purpose 361,290 copies of the following circular were printed in the principal languages of the Philippines and given the widest possible distribution; 10,000 copies were prepared in English, 5,150 in Spanish, 71,200 in Tagalog, 42,975 in Ilocano, 70,840 in Cebu-Visayan, 56,550 in Iloilo-Visayan, 7,700 in Ibanag,

19,250 in Pangasinan, 13,675 in Pampango, 29,450 in Bicol, and 34,500 in Leyte-Visayan:

THE GOVERNMENT OF THE PHILIPPINE ISLANDS,
DEPARTMENT OF THE INTERIOR,
BUREAU OF FORESTRY.

MANILA, *July 1, 1915.*

To the people of the Philippines:

The public forests are administered by the Bureau of Forestry for the good of all the people of the Philippines. The needs of the local inhabitants are always given first consideration; and it is only when a province contains timber, fuel, and other forest products in greater amounts than are needed for local use that cutting for export is permitted. Also, other things being equal, local inhabitants are always given preference in obtaining forest licenses of all kinds.

A cheap and abundant supply of suitable lumber, fuel, and other forest products is absolutely necessary for the prosperity and well-being of the people and for all industrial development. This is impossible unless the forests are protected and carefully administered. Otherwise, agriculture and all its dependent industries must suffer. Home building would be more expensive and difficult. The forests also protect the rivers and regulate the supply of water which you need for the irrigation of your fields. If the forests are destroyed, the land becomes covered with worthless cogon, which furnishes a breeding place for locusts. The work of gathering and marketing timber, fuel, bejuco, and other forest products gives profitable employment to thousands of Filipinos. It is one of the most important industries in the Islands. If the forests are destroyed, this means of livelihood will no longer exist. It would be harder to earn a living and taxes would have to be raised.

The Bureau of Forestry exists for the sole purpose of bringing about the best use of the public forests by the people in general and of insuring a future supply for your children. It is the local inhabitants, therefore, who are the first to benefit from the work of the Bureau and who would be the first to suffer the disastrous effects of permitting the forests in your vicinity to be destroyed.

The Bureau of Forestry is conducted without cost to the taxpayers of the Philippines. In fact, it saves you a great deal of money, for every year many thousands of pesos of forest revenue are turned over to the Insular, provincial, and municipal treasuries and used for building schoolhouses for the education of your children, for better roads, and for many other public enterprises. If it were not for this forest revenue, taxes would have to be increased or public work would have to be decreased. The charges collected from commercial licensees for the timber and other forest products they cut are not taxes. They represent merely the cost of public property sold to the licensees and are collected so as to permit all the people, and not merely the licensees, to share in the profits derived from the forests.

The public forests are owned by the people of the Philippines as a whole, just as the municipal buildings are owned by the people of the municipality. To preserve and to make the best use of a presidencia or tribunal, municipal ordinances are necessary. So, to preserve and make the best use of the public forests, certain forest laws and regulations have been adopted by the Philippine Legislature. No one is permitted to burn or

destroy a presidencia and anyone is punished that attempts to do so. The municipal president and council make regulations which provide for the proper use of the building by all the inhabitants of the municipality. In the same way, no one is permitted to destroy the public forests, which are the property of all of the people. It is, therefore, to the interest of all the people of the Philippines to help protect the forests by seeing that the forest regulations are enforced, and the Bureau of Forestry requests the active help and support of all patriotic citizens so that the forests may be put to the wisest and most profitable use and at the same time preserved in good condition for coming generations. You can help by discouraging all violations of the Forest Law, by reporting to the nearest forest officer all such violations as are committed, and by using your influence to promote a good understanding between the Bureau of Forestry and the people. In no country in the world are the forest regulations more liberal than those which have been adopted by the Philippine Legislature. These provide that:

1. Second and lower group timber and all minor forest products (such as leñas, bejuco, resins, etc.) may be gathered for personal use in the public forests free and without license.

2. Gratuitous licenses for first-group timber may be obtained for the construction of a house of strong materials for personal use. (Ask the president of your municipality to show you a copy of Act No. 2371.)

3. If a communal forest has been set aside for a municipality, the inhabitants must obtain therefrom all their free timber and minor forest products.

4. Timber and all other forest products which are desired for sale or for any other commercial purpose must be obtained under licenses issued by forest officers.

5. The forest charges on all products cut under commercial or "ordinary" licenses should be paid by the licensee to the nearest municipal treasurer.

6. Under certain conditions, caiñgin permits may be secured from forest officers for land not covered with merchantable timber.

7. Gratuitous licenses may be issued by forest officers for second and lower group timber desired by provinces or municipalities for public works.

All who desire homesteads may, if they wish, consult the local forest officers as to suitable areas available for such purposes.

It is unlawful—

1. To cut or gather public timber or any other forest products for sale or for any other commercial purposes without a proper license. Violations are punished by fines or by seizure of the forest products unlawfully obtained.

2. To cut first-group timber from the public forests for any purpose whatever without a license.

3. To make a caiñgin on public land without proper permit from a forest officer. Violations are punished by fine or imprisonment or both.

4. To set fire for clearing private lands adjoining the public forests without proper permit.

5. To cut any timber on a parcel of land applied for as a homestead until (*a*) approval of the application has been received from the Director of Lands, or (*b*) until permission in writing is secured from a forest officer.

6. To transport to market and to discharge at destination any forest

products without first obtaining proper guias and permits from the corresponding municipal treasurers.

7. To use first-group timber cut under gratuitous license without first obtaining a guia from the municipal treasurer.

8. To remove or otherwise to dispose of timber or other forest products from private woodlands without previously obtaining the proper guias from the municipal treasurer. If the private woodland has been registered in the Bureau of Forestry, no forest charges have to be paid. If the land has not been properly registered in the Bureau of Forestry, ordinary charges will be collected. This procedure applies also to homesteads.

CAUTION.

For your own protection, do not purchase timber or any other forest products without first being sure that it has been obtained under license and that the proper forest charges have been paid by the licensee. Preferably, obtain a written receipt from the seller. This relieves the purchaser of all responsibility. If you hold a forest license, either gratuitous or "ordinary," read it through thoroughly and carefully before you begin operations. If you have any doubt, consult or write at once to the nearest forest officer.

All forest officers are instructed that one of their principal duties is to advise and assist the public in every possible way. Do not hesitate to apply to them, or to the Director of Forestry in Manila, for any further information you desire. Forest officers may be found at any of the stations listed below, or else you may consult them on their periodic trips to your municipality.

W. F. SHERFESEE,
Director of Forestry.

LOCATIONS OF FOREST STATIONS.

[By provinces, geographically arranged.]

Aparri, Cagayan.
Vigan, Ilocos Sur.
Baguio, Benguet.
Dagupan, Pangasinan.
Cuyapo, Nueva Ecija.
Cabanatuan, Nueva Ecija.
Norzagaray, Bulacan.
Orani, Bataan.
Moron, Bataan.
Limay, Bataan.
Montalban, Rizal.
Los Baños, Laguna.
Sampaloc, Tayabas.
Infanta, Tayabas.
Malicboy, Pagbilao, Tayabas.
Guinayangan, Tayabas.
Paracale, Ambos Camarines.
Naga, Ambos Camarines.
Sorsogon, Sorsogon.
Masbate, Sorsogon.
Calapan, Mindoro.
San Jose, Mindoro.
Catbalogan, Samar.
Tacloban, Leyte.
Iloilo, Iloilo.
Cadiz, Occidental Negros.
Murcia, Occidental Negros.
Ilog, Occidental Negros.
San Carlos, Occidental Negros.
Dumaguete, Oriental Negros.
Surigao, Surigao.
Davao, Davao.
Kolambugan, Lanao.
Zamboanga, Zamboanga.
Naga Naga, Zamboanga.
Puerto Princesa, Palawan.

Most of these were sent to the presidents of all municipalities in the Islands with a letter asking them to post copies of the circular in conspicuous places in their municipality and distribute

the rest to the residents and specially to those who live in outlying barrios. The Bureau of Constabulary and the Bureau of Education also lent their help to distribute these circulars. Valuable assistance was also given by the governors of provinces and by members of the Philippine Assembly. In addition, of course, each forest officer was supplied with a number of copies with instructions to post them in outlying places and to distribute them on his regular trips. Taking into consideration that there are still a good number of Filipinos who are unable to read and also the fact that verbal discussions are so much more effective than printed matter, each forest officer was instructed to use every opportunity to hold informal meetings on his field trips in order to make the people acquainted with the contents of the circular and, in addition, to answer questions in reference to the use of the public forest and to the homesteading of public lands. As a result of these instructions, forest officers gave 1,207 informal talks during the period from April to December and addressed in these meetings 81,000 people. The results of this propaganda have already been felt. The Director has received various letters from influential people congratulating him on his idea of education and confirming his opinion of the great value of such a propaganda. Many forest officers report that, especially in outlying places, people have been very eager to come to these informal meetings and have shown great interest in the matters which were thus brought to their attention.

The assistance of the press has also been secured, and it is a pleasure to state that all newspapers in the Philippine Islands, both those published in the local languages and in English, have given liberal space in their papers to the discussion of forest problems. One of the local papers, El Ideal, published a series of articles, prepared by Director Sherfesee, referring to forestry and conservation in other countries, so giving the people of the Philippines an opportunity to compare our own forest work with that of other countries, some of which have practiced forestry for centuries and others have been compelled to do so recently, after they had seen their forests destroyed and had noted the disastrous effect of this destruction on agriculture and on the welfare of the country in general. The Bureau of Forestry takes this opportunity to extend to the editors of all newspapers in the Philippines its appreciation of their cordial coöperation.

LEGISLATION.

During the session of the Philippine Legislature which closed on February 5, 1915, Act No. 2451 was passed, which is of the greatest importance to the Bureau and reads as follows:

THIRD PHILIPPINE LEGISLATURE, *Third Session.* } { C. B. No. 63.

[No. 2451.]

AN ACT AMENDING PARAGRAPH EIGHT OF SECTION TWELVE OF ACT NUMBERED ELEVEN HUNDRED AND FORTY-EIGHT BY PROVIDING THAT ALL TIMBER CUT IN PUBLIC FORESTS SHALL BE MEASURED IN THE ROUND AND SPECIFICALLY AUTHORIZING A REASONABLE DEDUCTION FOR CERTAIN NATURAL DEFECTS, EXCEPT AS HEREIN OTHERWISE PROVIDED.

By authority of the United States, be it enacted by the Philippine Legislature, that:

SECTION 1. Paragraph eight of section twelve of Act Numbered Eleven hundred and forty-eight is hereby amended to read as follows:

"All timber shall be measured and manifested in the round or squared, before being sawn or manufactured. The volume of all round timber shall be ascertained by multiplying the area of the small end by the length of the log, the diameter of the log to be measured exclusive of the bark: *Provided,* That where the small end of a log is irregular, the average diameter shall be used: *And provided further,* That in order to ascertain the volume of a log more than eight meters long, the diameter of the middle of said log, or the average of the diameter at both ends thereof shall be used as basis. If a log in the round, cut under license, is measured and manifested by forest officers, the Director of Forestry shall make due allowance for rot, cavities, or other natural defects; but from any decision of the Director of Forestry in this respect, an appeal shall lie to the Secretary of the Interior, whose decision shall be final. The manifests of timber cut by licensees operating sawmills in or near the forest shall be attested by forest officers whenever practicable.

"Notwithstanding the foregoing provision regarding measurement in the round, licensees with sawmills may measure their timber or cause or allow the same to be measured after it is sawn, provided they pay for each thousand board feet of lumber of the first and second groups a sum of not less than ten pesos, and of the other groups of not less than five pesos, as forestry charges, in the discretion of the Director of Forestry and after agreement with the same, with the approval of the Secretary of the Interior. These agreements shall be for one year, but shall be subject to renewal.

"The volume of squared timber shall be ascertained by multiplying the average of the cross section measured by the length, to which twenty-five per centum shall be added for loss in squaring: *Provided,* That the privilege of manifesting timber after squaring shall be granted only to licensees who have squared their logs in the forest with the ax and intend to take it to the market in this form. If sawn or otherwise manufactured timber is found which has not been manifested in accordance with the provisions of this Act, the corresponding forest charges will be assessed on twice the volume of the actual contents of such sawn or manufactured timber."

SEC. 2. All Acts or parts of Acts inconsistent with the provisions of this Act are hereby repealed.

SEC. 3. This Act shall take effect six months after its passage.

Enacted, January 29, 1915.

A bill similar to the above had been introduced during the year 1913. It passed in the Commission, but failed of action in

the Assembly. This new law, which became effective July 29, 1915, affects especially the owners of sawmills which cut their own timber. Formerly, these were allowed to invoice their lumber after it had been sawn, paying a recharge of only 15 per cent for loss in sawing. This 15 per cent was supposed to cover the loss of material in slabs, sawdust, edgings, and waste of all kinds, necessary and unnecessary. That this was entirely inadequate will be evident to anyone with the slightest knowledge of milling operations.

The lumberman now pays for the log in the round as is done in all other countries and it is to his interest to get the largest possible amount of lumber out of the logs. The prime object of this law is not to make the lumberman pay more for the timber he cuts from the public forest, but merely to make it more worth his while than it was formerly to prevent unnecessary waste and to require him to pay for all the merchantable timber he cuts and not only for that portion of it which is easiest to utilize.

During the session of the Philippine Legislature, which has just closed at the time this report is being prepared, a number of acts were introduced and passed which are of the greatest importance for this Bureau.

On October 26, 1915, Act No. 2532 was passed which extends the period during which second and lower group timber and other forest products can be used without license and free of charge for another five years.

During the last hours of the session, Act No. 2578 was passed, which provides for the separation of the Forest School from the College of Agriculture and designates the Director of Forestry as ex officio dean of the new College of Forestry. This Act was presented in the Assembly as a result of a report prepared by an Assembly committee consisting of Delegate Romualdez, as chairman, and Delegates Reyes, Leuterio, Mahinay, and David as members, which committee had investigated the Bureaus of Agriculture, Lands, Science, and Forestry with the view to make recommendations as to possible consolidation of some of these Bureaus. The committee found that the work of the Bureau of Forestry is of such a character that it cannot be efficiently performed in any other Bureau and that the Bureau of Forestry should continue to exist as a separate institution. The pertinent part of the report reads as follows:

BUREAU OF FORESTRY.

After a most careful consideration of the Bureau of Forestry from all points of view, it is the firm conviction of your committee that now, as in the past, the suggestion to consolidate Forestry and Agriculture, either

the College of Agriculture or the Bureau of Agriculture, or, in fact, the suggestion to consolidate the Bureau of Forestry with any other branch of the Government, has arisen from a lack of definite appreciation or from a mistaken idea of what forestry really is and of the objects for which the Bureau of Forestry exists and of the kind of work which the members of the Bureau are called upon to perform. We, therefore, propose to set forth a brief statement of the principal duties of the Bureau of Forestry, before making definite recommendations.

In general, the Bureau of Forestry has as its principal objects to promote the most profitable utilization of the public forest resources and, at the same time, to administer such utilization so that the forests themselves will be transmitted in good or even better condition to posterity. The combination of these objects requires technical ability of a special order, which can only be secured through thorough training in a forest school, supplemented by practical experience in the forests after graduation; also, as the forests under the administration of the Bureau of Forestry cover some 16,000,000 hectares, being operated over by thousands of licensees, the successful operation of the Bureau of Forestry necessitates administrative experience and ability on the part of those in charge. Any lessening of the Bureau's influence or control would undoubtedly tend to lessen the amount of forest revenue collected. It is, therefore, evident that the Bureau's influence should not be diminished unless there are very strong reasons to the contrary; but your committee has found no such reasons to exist.

Far more timber is allowed to rot every year in the forests than is cut and utilized under license, and, therefore, it is most desirable that the Government should do everything it can to stimulate the lumber industry, in order to use the forest products which are now going to waste and in order to give the country the benefit of industrial activities along all lines as well as making it possible to eliminate the imports of lumber and develop a large export trade. It is evident, however, that lumbering has nothing whatever to do with agriculture, either in theory or in practice. The lumber industry of the Philippine Islands is now supervised by the Bureau of Forestry and, if the control were transferred from a technical forestry organization to an agricultural organization or to any other branch of the Government which has not had experience in practical lumbering, the confidence of the lumbermen in the Government would be decidedly impaired and the lumber industry as a whole would very probably suffer.

In their work in supervising the operations of the timber licensees and protecting the public forests against theft and fire, the rangers of the Bureau are called upon to perform such duties as inspecting the operations of the timber licensees, measuring abandoned timber or timber illegally cut and preparing the necessary invoices, the making of forest maps and describing woodlands to be set aside as communal forests, preparing cases for prosecution against illegal caiñgineros, timber estimating, inspecting operations of sawmills, and other allied lines directly connected with the administration of the public forests. It is evident that in the carrying out of such work neither the Bureau of Agriculture nor the College of Agriculture plays any part whatever. Each of these organizations as has been shown above has its own objects to fulfil and it could only result in a mutual loss of efficiency to combine two such different branches of the Government.

Your committee has questioned various members of the Bureau of Forestry and the Bureau of Agriculture, and we find that in education, as

in actual practice, the work of the two classes of men has been entirely distinct. No forester has received any agricultural training and no member of the Bureau of Agriculture has been trained as a forester. Therefore they could not mutually assist each other.

But a small amount of investigative work is carried on by the Bureau of Forestry, and such as is carried on has for its principal object the securing of data necessary for the more efficient regulation of the lumber industry, such as, for instance, the rates of growth of the principal commercial trees, their characteristics, including durability, strength, hardness, etc. In none of its investigative work any more than in its practical work do the activities of the Bureau of Forestry touch those of agriculture.

As the work of the Bureau of Forestry is so distinct and separate from that of the Bureau of Agriculture and that of the College of Agriculture, both in theory and in practice, it is evident that a fusion of the two institutions would only mean that they would exist as separate and distinct divisions under a single bureau chief. Evidently, if such a fusion were carried out, the chief of the united Bureaus would be either an agricultural expert or a professor of agriculture or a forester. Your committee fails to see that any efficiency or economy could be promoted by having the work of the Bureau of Forestry directed by an agricultural expert or an agricultural professor; and equally it would be inadvisable to have the work of the Bureau of Agriculture or of the College of Agriculture directed by a forester who knew nothing about agriculture. Therefore, for all of the above reasons, your committee finds that efficiency would be sacrificed rather than promoted by the fusion of the two institutions.

In reference to economy, we find that economy would not be promoted by the combination of the Bureau of Forestry with either the Bureau of Agriculture or the College of Agriculture. The same work would have to be done in any case and it would cost as much in one Bureau as in another. The present salary of the Director of Forestry is ₱7,600 per annum. If he were made the chief of a division of forestry in another Bureau, his salary might be reduced to ₱6,000 per annum. This insignificant saving of ₱1,600 per annum would probably, as shown above, be far more than offset by the loss in forest revenues and in a setback to the lumber industry. Again, if the Bureau of Forestry, as has been suggested in the past, should be merged with the college of Agriculture at Los Baños, the combination, instead of resulting in a saving to the Government, would necessitate a heavy expenditure for buildings, etc., at Los Baños, and for transportation. Moreover, as much of the Bureau's business must be performed in Manila, it would be necessary to maintain a branch office here. Thus the expense of administration would be distinctly increased by the combination.

As the suggestion has also been made that the Bureau of Forestry be combined with the Bureau of Lands, your committee took occasion to investigate the advisability of such a suggestion. As a result we find that the activities of the Bureau of Forestry are equally as distinct from the Bureau of Lands as they are from the Bureau of Agriculture. There is no duplication whatever and the same considerations that argue against the combination of the Bureau of Forestry with the Bureau of Agriculture hold against the proposed combination of the Bureau of Forestry with the Bureau of Lands. Also, in the case of the Bureau of Lands there is the special consideration that the Congressional Act, dated July 1, 1902, section 18, contains a provision that a certificate from the Bureau of Forestry is necessary before any public land can be homesteaded, sold,

or leased. Apparently the intention of Congress in making this provision was that there should be an impartial examination and certification before title to any parcel of public land should pass from the Government to private ownership and, as most of such public land is forested, the duty of making such an impartial certification was naturally imposed upon the Bureau of Forestry. It is evident that to merge the Bureau of Forestry with the Bureau of Lands would result in placing the certification as to the character of public lands in the hands of the same official who has power to dispose of such lands and, therefore, the object of the congressional provision quoted above would be defeated and rendered absurd, thus evidently bringing down upon the Philippine Legislature severe criticism in Congress.

THE FOREST SCHOOL OF THE BUREAU OF FORESTRY.

The manner in which the activities of the Bureau of Forestry touch those of the University of the Philippines is through the Bureau's Forest School at Los Baños, where a two-year course is given to prospective rangers under contract to enter the employ of the Bureau of Forestry upon completion of their studies. The school was incorporated five years ago as a department in the College of Agriculture, not because of any relationship between the courses to be given the rangers and the agricultural students, but because it was not considered advisable to spend more than a very small amount of money for the new school until it should have clearly demonstrated its permanent usefulness and practicability; because in the absence of a special appropriation it was necessary to take advantage of the existing buildings at the College of Agriculture in order to have a place to conduct recitations and to enable the students to carry on the necessary laboratory work, and because the College of Agriculture happened to be located near the Mount Maquiling Forest Reserve, which it was desired to use as a demonstration ground for the forest students. It was realized that the courses which the forest students would need would differ from those of students of agriculture, but the inclusion of the Forest School in the College of Agriculture was considered advisable as a temporary measure. The Forest School has long since demonstrated its usefulness, and there can be no doubt that a real and pressing need exists for a permanent institution of this kind. The time has come and passed when the permanent status of the Forest School should be established in order that forest students may be given the training to best fit them for their forest work and that such training may be given in the most efficient and economical manner.

A bill to separate the two institutions entirely passed the Philippine Assembly three years ago, but failed of action in the Commission because objection was made to the wording and not to the intent of the bill. (See Commission Journal, first session and special session of 1913.)

The forestry and agricultural courses are necessarily kept distinct, not because of any desire to do so, but because they are naturally different. Thus, the only two courses which the forest students take from the instructors of the College of Agriculture are botany and mathematics. This course in botany is described in the university catalogue as "a course designated especially for forestry students. The first half treats of the physiology of plants. The second half is devoted to the special and general anatomy of woody plants. This course is intended to serve as a foundation for the following year's work in wood technology and silviculture." All other courses are given by instructors detailed from the Bureau of For-

estry, and the only real need for coöperation with the College of Agriculture in the past was the use of their lecture and school rooms.

At its last session the Philippine Legislature made an appropriation to the Bureau of Forestry to construct a school building for the Forest School at Los Baños and, therefore, as soon as the building is completed, there will no longer exist any need for the forestry students to use the school building of the College of Agriculture. Without increasing the force of instructors, the forest students can be given mathematics and botany by their own instructors at least as well adapted to their needs as that which they now obtain from the instructors in the College of Agriculture, and hence it would involve no additional expense and no increase in personnel to put the Forest School upon a permanent basis and to make it a college or school or academy in the University of the Philippines. Your committee strongly recommends that the Philippine Legislature pass a bill requesting the regents of the university to separate the Forest School from all connection with the College of Agriculture and to organize it as the Forest Academy of the University of the Philippines or under some similar title. The Director of Forestry should be ex officio dean of the Forest Academy and ex officio professor of forestry in the University of the Philippines. Such a provision is most necessary on account of the following considerations: By far the majority, if not all, of the students of the Forest School will enter the Government service upon graduation. It is to enable the Government to secure the services of properly trained Filipino rangers and foresters that the school was established and is maintained. Private students come in, but their number is and will be relatively small. It is to this school that the Bureau of Forestry must look for the great majority of its future personnel. The Director of Forestry is under contract to employ the forest pensionados when they complete the course at the school. It is, therefore, obvious that the management of the school and the courses given to the students should be such as to fit them primarily for the work which they will be called upon to do in the Bureau. This being true, and in order to avoid conflict of authority with a weakening of administrative efficiency, we are recommending that the Director of Forestry be made ex officio dean of the Forest Academy and ex officio professor of forestry of the university. Such a course is obviously the most economical, as the Director of Forestry will naturally serve in such a capacity without additional compensation, whereas otherwise a salaried dean would have to be secured. Such an arrangement would be no new precedent, as it has been found to work to good advantage in other cases.

Therefore, your committee recommends that the Forest School be separated from the College of Agriculture and organized as a separate and distinct Forest Academy in the University of the Philippines; and that the Director of the Bureau of Forestry be ex officio dean and professor of forestry. In all other particulars the Forest School should continue to be administered as at present.

To carry out this plan, it is suggested that a bill be passed by the Philippine Legislature requesting the Board of Regents of the University of the Philippines to act in accordance with these recommendations.

It is hoped that from now on no more efforts will be made to abolish the Bureau of Forestry or to consolidate it with some other Bureau. Efforts to this effect have been made almost every year during the last five or six years and have produced

a very bad effect on the personnel of the Bureau of Forestry as, of course, forest officers cannot be expected to take such interest in their work as they should if they always fear that the Bureau would be abolished and that they might find themselves without a position.

Besides the general appropriation act, ₱18,000 have been included in the public works appropriation act to be used for the construction of quarters for the students at the Forest School and for the termination of the Forest School building which was started during the past year. A number of Assemblymen who had visited the Forest School became so convinced of the necessity of special appropriation for quarters that they introduced a special bill appropriating ₱12,000, but the general economy which the Philippine Government has had to practise made it necessary to reduce this figure to ₱8,000.

FOREST MAPS.

Much has been accomplished in the division of forest maps. During the fiscal year 1912 some 2,000 kilometers of trail notes were taken by forest officers and embodied in the base maps prepared in this division. During the present year almost 8,500 kilometers of trail notes have been worked over, and consequently much progress has been made in the preparation of the base maps at scales of 1:20,000 and 1:100,000. In addition, 70 maps of communal forests have been prepared and 6 copies of the large forest map of the Archipelago.

The assistant forester in charge was in the field for one hundred and thirty-six days, directing the forest reconnaissances in the Agusan Valley and in the naval reservation of Olongapo, besides making several short trips in connection with important land registration cases. The two rangers attached to this section spent eighty-seven days in the field. They in turn were in charge of the office work during the absence of the assistant forester and discharged their duties very satisfactorily. During the past year an unusually large number of applications were made to the General Land Registration Office by claimants of private land who desire to have their land registered. The Bureau of Forestry receives copies of all these requests containing the description of the lands in question. These are carefully scrutinized by the assistant forester in charge of forest maps or by one of his two ranger assistants in order to ascertain whether or not the land to be registered contains forests. If this is the case, a local investigation is ordered and the fiscal of the province concerned is requested to enter opposition against the registration of such land. On account of the cadastral surveys which the Bureau of Lands has completed during the

past year, this line of work will still increase considerably, and will require the greatest attention during the coming year so as to avoid the loss by the Philippine Government of forest land which is illegally claimed by private parties.

THE OFFICE OF THE WOOD EXPERT.

The work of this office falls naturally into three main heads: The preparation and classification of the working collections of specimens of timber and minor forest products; the study of the properties and utilization of these products; and, finally, the practical application of these studies—that is, the dissemination by all possible means of the knowledge so gained, this last being, of course, the ultimate object for which the office exists. Beside information given in correspondence, in articles published in technical and trade journals, and in bulletins published by the Bureau, a valuable means of information and propaganda is the distribution every year of several thousand carefully identified and properly labeled hand specimens of Philippine woods, 1/4 by 4 by 6 inches in size.

In spite of the very large amount of time devoted, during 1914 and the first months of 1915, to the preparation of the exhibits at the Panama-Pacific International Exposition, the work of this section has not only been carried on as actively as in former years, but certain established lines of work have been developed more in detail and some new features taken up. It is difficult to specify in detail the changes made in methods; broadly speaking, greater accuracy has been introduced in collating and indexing all data regarding distribution and abundance of timber trees and minor products, their local names, uses, prices, etc., thus making it easier to furnish on short notice complete and comprehensive information about any one given species.

Collections both of botanical specimens and wood specimens made by forest officers have contributed much to our knowledge of the timber trees. Over 1,600 botanical specimens were collected and forwarded to the Bureau of Science. Duplicate sheets to the number of 1,300 were returned by the Bureau of Science to this office and forwarded to the forest stations of the regions in which they were collected. In this way each station is being gradually supplied with a working herbarium of the tree species found within its jurisdiction. In addition to this, there has been inaugurated during 1915 a similar system of returning to the forest stations duplicate hand specimens prepared from the wood specimens collected in their respective districts, thus laying the foundation in each station of a collection of authentic and properly labeled wood specimens peculiar to its district.

During the year, 888 such specimens were prepared and forwarded to the stations. Of the 1,600 botanical collections, 495 were accompanied by wood specimens. Beside these, about 130 trade samples were received and identified. To the list of planks 19 numbers were added, of which a large proportion are of unusual value, partly as being either unusually fine specimens and partly because a number of them were cut from trees from which botanical material was also obtained. One of the storms in December furnished the opportunity of securing botanically authenticated planks of talisai (*Terminalia catappa*) from a tree blown down in the Botanical Garden which happened to be in flower at the time. Ten new floor specimens (logs) were received, which have been roughed out and installed temporarilly to season. Nearly 200 numbers were added to the collection of foreign specimens, bringing the total up to about 1,500. About 4,800 hand specimens were sent out during the year; of these, 1,748 were furnished to the Forest School, 1,194 were distributed gratis or exchanged, 778 sold, and 888 sent to forest stations. There were on hand at the end of the year about 5,500 specimens, representing over 200 species.

A valuable addition to the records of the office has been made by extracting all local names from phenological reports received during the year, as well as from lists of local synonyms forwarded by forest officers in compliance with the circular letter of January 28, 1915; over 1,000 cards were added to the "common name index" from these sources. Having been collected by rangers with technical training, knowledge of local languages, and a working acquaintance with the trees of their districts, these data naturally possess a high percentage of reliability.

During the latter half of the year the wood expert was occupied almost exclusively with the preparation of a new bulletin entitled "The Commercial Timbers of the Philippines: Their Preparation and Uses." His assistants spent considerable time in collating data regarding distribution and local names of the trees described in the bulletin.

DIVISION OF ADMINISTRATION.

The division of administration, as its name implies, is the administrative and executive branch for putting into actual effect the policies of the Bureau. Its principal work lies in the inspection of the work of the licensees; the examination of tracts of public land applied for as homesteads, and for lease, or purchase; examining proposed communal forests; making maps; taking trail notes; and collecting botanical and wood specimens. In addition, so far as time permits, forest officers of this division coöperate with the Bureau of Internal Revenue in the collection of forest

charges. The members of this division are also called upon to prevent the making of illegal caiñgins, and to assist in the prosecution of those who make them. Finally, they have to report on forest land which is claimed as private property, and which the claimant desires to have registered. During the past year this latter work has increased considerably. For carrying on all these different branches of work, the Philippine Archipelago is divided into 12 forest districts. Of the officers in charge of these districts, 10 are Filipinos and 2 are Americans.

PERSONNEL.

At the close of the year; the field force of the division consisted of 4 foresters, 1 assistant forester, 83 rangers, and 19 guards, a total of 107 men as compared with 101 at the close of 1914. The foresters were Americans, 1 of whom devoted a considerable part of his time to instruction work at the Forest School and the other was in charge of the large district of Mindanao and Sulu. Two foresters and 10 rangers resigned during the year. One new forest district was created, the Island of Mindoro being separated from district No. 5 and forming now district No. 12 with headquarters at Calapan. New forest stations were established at Infanta, Tayabas; Calivo, Capiz; Ilog, Occidental Negros; Fabrica, Occidental Negros; Port Banga, Zamboanga; Cotabato, Cotabato; Naga Naga, Zamboanga; Davao, Davao; and San José, Mindoro, the total number of forest stations at the end of the year being 39.

KIND OF WORK PERFORMED.

The following table, which is compiled from monthly service reports of all forest officers, shows the time devoted to and the cost of each of the most important kinds of work performed by the members of the division during the year. As in former years, the inspection of cutting areas and the work connected with the supervision of licensees took up most of the time of forest officers. Next came the inspection of public land applied for under the homestead law, and third, the work connected with the protection of the public forests through the prevention of illegal caiñgins.

PUBLIC LANDS.

Seven thousand and ninety parcels of public land were examined and reported on during the year as compared with 5,890 during the year 1914. Two thousand two hundred and forty-three applications were pending inspection on December 31, 1915, as against 2,961 at the close of 1914. As mentioned above, on account of the many resignations, the field work of the

Table showing number of days and cost of each class of work pe rformed by the field force of the division of administration during the fiscal year 1915.

District—	Licenses.				Public lands.				Caiñgins.				Communal forests.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.
No. 1	661	45.27	₱2,365	45.87	404	27.67	₱1,456	28.36	109	7.47	₱378	7.36	107	7.33	₱387	7.54
No. 2	500	50.40	1,713	49.55	239	23.08	921	26.64	28	2.83	99	2.86	37	3.74	127	3.67
No. 3	209	40.74	649	43.06	28	5.46	109	7.23	20	3.90	74	4.91	12	2.34	53	3.52
No. 4	771	32.58	2,128	31.45	896	37.87	2,856	42.20	79	3.34	237	3.50	96	4.05	336	4.97
No. 5	524	19.10	1,825	15.46	661	24.09	2,061	17.46	179	6.52	368	4.81	42	1.53	143	1.21
No. 6	1,509	42.63	4,644	42.62	701	19.80	2,297	21.06	260	7.34	946	8.68	79	2.23	290	2.66
No. 7	2,283	35.90	6,342	35.61	1,309	20.57	3,335	18.73	649	10.20	2,065	11.59	347	5.45	1,037	5.82
No. 8	2,919	59.14	12,190	64.66	970	19.63	3,400	18.04	150	3.04	426	2.27	109	2.20	367	1.95
No. 9	396	39.48	1,668	42.81	137	13.66	576	14.78	67	6.68	245	6.29				
No. 10	773	38.83	2,150	37.72	432	21.96	1,269	22.27	214	10.89	675	11.85	96	4.88	306	5.33
No. 11	1,699	48.64	3,880	43.37	615	17.61	1,727	19.30	104	2.98	396	4.43	67	1.94	174	1.95
No. 12	425	29.11	1,279	28.92	431	29.52	1,422	32.15	78	5.37	279	6.31	3	.20	7	.21
Total	12,669	41.07	40,823	41.16	6,823	22.12	21,429	21.61	1,937	6.28	6,388	6.44	995	3.23	3,227	3.25

District—	Botanical collections.				Sundays and holidays.				Leave.				Reconnaissance.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.
No. 1	27	1.85	₱110	2.15	140	9.59	₱411	8.00	6	0.41	₱13	0.25				
No. 2	25	2.52	96	2.78	136	13.70	423	12.24	14	1.42	35	1.01				
No. 3	11	2.14	48	3.19	71	13.84	207	13.74	16	3.12	49	3.25				
No. 4	14	.59	35	.52	296	12.51	632	9.34	113	4.77	236	3.49	81	3.42	₱271	4.00
No. 5	16	.58	41	.35	358	13.05	1,299	11.00	140	5.10	449	3.80	183	6.67	437	3.70
No. 6	36	1.02	174	1.59	450	12.71	1,073	9.84	175	4.94	407	3.74	136	3.84	426	3.91
No. 7	49	.80	149	.84	850	13.37	1,832	10.29	270	4.24	590	3.31	31	.5	136	.77
No. 8	107	2.17	359	1.91	584	11.84	1,899	10.07	97	1.98	209	1.10				
No. 9	17	1.70	51	1.30	154	15.35	513	13.18	20	1.99	51	1.30	135	13.46	620	15.90
No. 10	42	2.19	131	2.30	258	13.11	564	9.89	27	1.48	54	.94				
No. 11	104	2.98	261	2.92	465	13.31	1,002	11.20	95	2.71	220	2.46				
No. 12	16	1.06	46	1.04	208	14.28	575	13.01	124	8.51	317	7.16	49	3.35	149	3.37
Total	464	1.51	1,501	1.51	3,970	12.87	10,430	10.51	1,097	3.56	2,630	2.65	615	2.00	2,039	2.06

District—	Nurseries.				Patrol trail and trail building.				Miscellaneous.				Travel.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.
No. 1	5	0.34	₱20	0.39					1	0.07	₱4	0.08				
No. 2	13	1.31	43	1.25												
No. 3	74	14.42	215	14.27	58	11.31	₱85	5.64	14	2.73	18	1.19				
No. 4	4	.20	5	.07					16	.67	31	.46				
No. 5	7	.26	9	.08	23	.84	91	.77	595	21.68	4,790	40.58	16	0.58	₱92	0.78
No. 6	9	.25	21	.19	22	.62	83	.76	138	3.91	415	3.80	25	.71	117	1.70
No. 7	1	.02	5	.03	50	.80	177	.99	456	7.17	1,667	9.36	63	.98	474	2.66
No. 8																
No. 9									77	7.68	173	4.44				
No. 10	19	.98	60	1.05					72	3.80	246	4.31	35	1.88	245	4.29
No. 11	18	.51	66	.73	45	1.28	140	1.56	269	7.70	998	11.16	12	.34	82	.92
No. 12									124	8.5	342	7.73	2	.1	5	.10
Total	150	.49	444	.45	198	.65	576	.58	1,762	5.72	8,684	8.76	153	.50	1,015	1.02

SUMMARY.

District.	Total days.	Total cost.	District.	Total days.	Total cost.
No. 1	1,460	₱5,134	No. 8	4,936	₱18,850
No. 2	992	3,457	No. 9	1,003	3,897
No. 3	513	1,507	No. 10	1,968	5,700
No. 4	2,366	6,767	No. 11	3,493	8,946
No. 5	2,744	11,805	No. 12	1,460	4,421
No. 6	3,540	10,893			
No. 7	6,358	17,809	Total	30,853	99,186

division was on an average only increased by 6 men, and it is very gratifying to be able to report that in spite of the small increase in force it has been possible, not only to inspect and report on a considerably greater number of parcels of public land than in former years, but it has also been possible to reduce the number of pending inspections considerably. These results have been brought about principally by the change in procedure. On request of the Secretary of the Interior, the following circular letter was sent to all forest officers:

In order to shorten as much as possible the period which must elapse between the date on which a homestead application is made and the date on which the resulting certification is transmitted by this office to the Bureau of Lands, forest officers will in the future adopt the following procedure:

1. If a forest officer, while in the field, assists a homestead applicant in preparing his application he will, if practicable, examine at the same time the land applied for. He will also make an extra copy of the application, attach to it his inspection report made out on regular B. F. Form No. 5, with the usual number of copies, and forward both through channels to this office, and under "Remarks" call attention to the circumstances under which the examination was made. He will also make a note on the original application (which the applicant will forward to the Bureau of Lands) to the effect that a copy has been retained by (give name of forest officer, place, and date) and that he is forwarding it, together with his report, to the Director of Forestry, Manila.

If the land shown to the forest officer is considered to be better for forest purposes, the applicant should be induced to change his application to a tract of land which is more suitable for agricultural purposes.

2. When it is impracticable for the forest officer, who assists in preparing the application, to make the land examination and report immediately, he will retain a copy of the application, make the examination, and transmit the report at the earliest possible date, meanwhile making an indorsement on the original application to the effect that a copy has been retained for early report. The original will then be forwarded by the applicant to the Bureau of Lands as at present.

3. If a forest officer helps to make out a homestead application in his office or in any place elsewhere than in the vicinity of the land applied for, or if he is furnished a copy of an application already made, he will take the first practicable opportunity to inspect the land, and forward his report attached to a copy of the application through channels to this office as soon as possible, even if the formal request for the examination and report has not yet been received from Manila. In case he helped to make out the original application, he will make a note thereon to the effect that a copy has been retained (give name of forest officer, date, and place).

4. Officials of the Bureau of Lands and municipal secretaries have been instructed to send to the nearest forest station copies of homestead applications as soon as they are received. Action on applications thus received by the forest officers will be taken as outlined under paragraph 3 above.

5. If a forest officer receives from the Manila office a request for the examination and report on a tract of land which has already been inspected and reported on under the procedure outlined above, he will return this request at once with the statement that the report has already been submitted under such and such a date.

A supply of homestead application forms and of B. F. Form No. 5 is being sent to every forest station, and forest officers should always take with them on their field trips a sufficient number of both forms.

W. F. SHERFESEE,
Director of Forestry.

As the result of the instructions contained in this circular letter, a large number of applications for homestead were made out with the assistance of forest officers and the report of the land in question was received in Manila at the same time as the application. So the time necessary for the approval of a large number of homestead applications was considerably shortened. In addition to this, the inspection of public lands has also been simplified in a few instances where large agricultural colonies were surveyed by the Bureau of Lands. Then the entire area was inspected by a forest officer and certified to as to its agricultural or forest value. These colonies are divided into subdivisions of 16 hectares each and, as all these subdivisions are numbered, it is only necessary to refer to the number and to the corresponding report of the entire area in order to ascertain if a certain homestead application can be approved or not. Steps have been taken by the Bureau of Lands and the Bureau of Forestry to extend these surveys to other parts of the Islands during the coming year.

LICENSES.

The total number of commercial timber licenses in force during 1915 amounted to 1,481 as against 1,483 during 1914. In addition there were granted 745 firewood licenses, 974 licenses for rattan, and 586 licenses for various minor forest products, including for the first time gogo. In all, 3,788 commercial licenses were granted as compared with 3,484 during 1914. A small decrease is shown in the number of private gratuitous licenses for first-group timber. Two thousand two hundred and eleven of these were granted during the year as against 2,350 during 1914. There were also granted 50 gratuitous licenses for public works and 34 licenses for timber used in the development of mines. In all, 6,083 were granted as compared with 5,897 during 1914, an increase of 186. This increase is smaller in proportion to the increase in past years. This is due to the general commercial depression which extends all over the world on account of the European war, and which is treated more in detail in another chapter of this report.

COMMUNAL FORESTS.

Sixty-three new communal forests were established during the year as compared with 42 during the year 1914. Sixty-seven

more are being considered and will be established during the earlier part of 1916. Some of the municipalities for which communal forests have been set aside have shown considerable interest in their use and protection and have even gone so far as to begin replanting. Others, however, did not pay sufficient attention to the protection of their forests and consequently a new circular containing instructions in reference to the administration and protection of communal forests was sent out on January 8 of the present year. The total number of communal forests now amounts to 279, distributed among the different provinces as shown in the following table:

Albay	6	Misamis	7
Ambos Camarines	19	Mountain	5
Antique	1	Nueva Ecija	6
Bataan	13	Occidental Negros	5
Bohol	6	Oriental Negros	4
Cagayan	14	Pampanga	1
Capiz	9	Pangasinan	25
Cebu	3	Rizal	2
Ilocos Norte	14	Samar	20
Ilocos Sur	29	Sorsogon	9
Iloilo	4	Tarlac	3
Isabela	11	Tayabas	20
Laguna	10	Zambales	14
La Union	9		
Leyte	8	Total	279
Mindanao and Sulu	2		

CAIÑGINS.

The making of illegal caiñgins has been persecuted with increased energy and vigor and with gratifying results. One thousand one hundred ninety-eight illegal caiñgins were reported to the provincial fiscals as against 895 during the year 1914. While during the year 1914 only 269 were acted upon, this number has increased during 1915 to 541 and convictions were secured in 507 cases as against 249 cases during 1914. These results are due to three factors: (1) increased activity on the part of forest officers; (2) increased interest and activity on the part of the provincial fiscals; and (3) the better understanding of the justices of the peace, who handle most of these cases, of the importance of preventing the destruction of public forests by illegal caiñgin makers. In former years the Bureau frequently had occasion to complain that the provincial fiscals did not take such action on caiñgin reports as they should. This attitude has now been changed entirely, which is especially due to the commendable efforts of the Attorney-General to instruct the provincial fiscals in their duties, and also to the provincial fiscals themselves, some of whom have been exceedingly active

in the prosecution of the violators of the Forest Act, and all of whom have at least complied with their ordinary duties in prosecuting violators. As a result of a circular letter sent by the Director of Forestry to all judges of the Courts of First Instance, many of these have issued instructions to the justices of the peace under their supervision, explaining to them the importance of the protection of the public forests, and counselling them to deal out adequate punishment in case the accused have been found guilty. In former years it has happened that a man who destroyed timber, the forest charges on which amounted to several hundred pesos, was found guilty, but given only a nominal fine of ₱5. Such judgments had a tendency to invite contempt of the law rather than to prevent repetition of illegal acts. The Bureau of Forestry will continue to make the strongest efforts to combat this evil, which is decidedly the greatest menace to the public forests of the Philippines and the lumbering interests as well as other industries which are dependent thereon. The following table shows the number of caiñgin cases reported from each province with the number acted upon during the year:

Caiñgins reported during 1915.

Provinces.	Reported by—			Acted on—		
	Forest officers.	Municipal president.	Total.	Convicted.	Acquitted.	Total.
Agusan						
Albay	78		78	4	2	6
Ambos Camarines	48		48	7	1	8
Antique	2	1	3	3		3
Bataan	51		51	18		18
Batanes						
Batangas	1		1	1		1
Bohol	29		29	13		13
Bulacan						
Cagayan	43	1	44			
Capiz	50		50	32	10	42
Cavite						
Cebu		6	6	6		6
Ilocos Norte	15		15			
Ilocos Sur	4		4			
Iloilo	1		1	1		1
Isabela	57		57			
Laguna	17		17	3	1	4
La Union	1		1			
Leyte	45		45	15		15
Mindoro	24		24			
Misamis	37	26	63	55	1	56
Moro	11		11			
Mountain Province	19		19	1		1
Occidental Negros	80	104	184	157		157
Oriental Negros	66		66	7	2	9
Nueva Ecija	45		45	24	3	27
Nueva Vizcaya						
Palawan	6		6			
Pampanga	19		19			
Pangasinan	18		18	9	5	14
Rizal						
Samar	70	3	73	20	2	22
Sorsogon	63		63	40		40
Surigao						
Tarlac	2		2			
Tayabas	117	18	135	71	7	78
Zambales	20		20	20		20
Total	1,039	159	1,198	507	34	541

TRAIL NOTES.

Whenever a forest officer goes to the field he is under instructions to take trail notes, especially in regions which have not as yet been visited or which are little known. These notes are, of course, not accurate from a surveyor's standpoint, as the directions are only taken with a hand compass and the distances by pacing, but they enable this Bureau to obtain much valuable information, not only in reference to the soil cover and the extension of commercial forests, etc., but also as to trails and roads, as well as to rivers and mountain systems. All these notes are plotted by the man who takes them and then sent, together with the sketch, to the map section of the Manila office, where they are revised and embodied in the progress maps of the different districts. During the year 1915 altogether 8,784 kilometers of trail notes were taken by the personnel of the division of administration.

The following table shows the number of trail notes taken in each district:

District—	Kilometers.	District—	Kilometers.
No. 1	661.42	No. 8	1,821.43
No. 2	68.51	No. 9	111.01
No. 3	61.52	No. 10	1,160.90
No. 4	384.38	No. 11	532.50
No. 5	548.57	No. 12	289.73
No. 6	978.79		
No. 7	1,765.36	Total	8,784.12

FOREST DISTRCTS.

As stated above, the Philippine Islands are divided for administrative purposes into 12 forest districts. Each officer in charge of a district submits his monthly reports and also, in addition, an annual report summarizing the work which has been done in his district during the past year. The following extracts are made from these reports. Each will give a general idea of the duties of a forest officer and the principal results of their work during the past year. Many details which are of interest and which contain a considerable amount of information have been omitted as consideration of space forbids quoting them.

DISTRICT NO. 1, WITH HEADQUARTERS AT APARRI, CAGAYAN.

The operations of the licensees in this district have in general been satisfactory, which is due to the repeated inspection by forest officers of their cutting areas. The number of illegal caiñgins has been reduced considerably, and it is believed that all those which were made have been detected and reported.

This is principally due to the propaganda carried on vigorously and to the many verbal instructions and explanations given to the people by the forest officers on their regular trips. Fourteen new communal forests have been established. The free-use privilege is still misused in many cases, as small undersized trees are cut, large waste is committed by not utilizing all parts of the trees which have been felled, and in many cases first-group timber for which a gratuitous license has been granted is being cut in a place different from that specified in the license. As these small gratuitous licenses, as well as the free cutting of second and lower group timber, are scattered over all the forests in the district, the detection of waste and illegal cutting is extremely difficult. The forest of the district suffered considerably through the typhoon which passed through the Cagayan Valley during the month of October. Many trees were uprooted and trails and roads, which under ordinary conditions are not of the best, were made impassable.

DISTRICT NO. 2, WITH HEADQUARTERS AT VIGAN, ILOCOS SUR.

In this district the general depression of the lumber market was not felt much, as the licensees here supply mostly only local demand. There are two sawmills in the district, one located near Burgos, Ilocos Norte, and the other near Sagada, Mountain Province. The former supplies the two Ilocos Provinces and the lumber turned out by the latter is almost exclusively used by the St. Mary Mission of Sagada, and its different institutions throughout the Mountain Province. Frequent inspections of cutting areas have resulted in a decrease of violations of the forest regulations. Most licensees have a tendency to cut smaller first-group trees, as these are in great demand for house posts and bring a good price. It was necessary in a few instances to cancel the licenses of licensees who continued cutting immature trees, and who declared themselves that the additional charges of 100 per cent collected for cutting of such trees could not stop them, as the prices obtained for their timber allow them to pay high charges. In general, the attitude of the licensees and the people in this district toward the Bureau of Forestry is very friendly, as the people realize that the Bureau and its representatives work for their own good. Considerable attention was paid during the year to botanical collections and 99 specimens forwarded to the Manila office. The district herbarium now contains 78 identified and mounted specimens. The good condition of the roads throughout the district and the use of the motorcycle which has been furnished the district made frequent trips to all parts of the district possible.

DISTRICT NO. 3, WITH HEADQUARTERS AT BAGUIO, BENGUET.

The greater part of the work of the forest officer of this district is confined to the city of Baguio reservation and its immediate vicinity. Two license agreements are in force here and the two sawmills established in connection therewith supply the residents of Baguio with the necessary pine timber. One of these licensees has installed an aërial cableway from his sawmill to the city of Baguio, which is used mainly for the transportation of firewood. As the supply of firewood is one of the most important problems to be solved in this district, this aërial cableway is of the greatest importance, as by it the price of firewood has been reduced by about 20 per cent. In order to secure sufficient reproduction and, especially in the vicinity of Baguio, to protect the beauty of the scenery, all trees which are to be felled are being marked by forest officers. Nearly 5,000 trees have been marked during the past year. By the leaving of seed trees, a satisfactory reproduction has been obtained and it has been found that if from 10 to 20 trees per hectare are left, sufficient seedlings will start up to reforest the cut-over area. In some places it was observed that the pine seedlings came up very dense in spots where the surface of the soil had been broken by the logging operations.

Inside the Baguio civil reservation only old and defective trees are being marked for cutting and consequently only about one-third of the trees in a given area are cut. The greater part of the branches is utilized for firewood, and twigs and leaves are burned by the licensees.

The prevention of forest fires inside the Baguio reservation has been taken over by the town officials, and is carried on under the supervision of the chief of police. The Bureau of Forestry employs firewardens, two each in the forests covered by the two above-mentioned concessions and one in the mining region of the Antamok Valley. Twenty-nine forest fires were reported during the year, more than half of these occurring in the mining region.

DISTRICT NO. 4, WITH HEADQUARTERS AT DAGUPAN, PANGASINAN.

Lumbering in this district is mostly confined to the Provinces of Zambales, Pangasinan, and eastern Nueva Ecija. The scarcity of timber in Pangasinan has made it necessary to prohibit the exportation of timber to other provinces so as to assure the residents of the province of a sufficient supply of building materials at reasonable prices. In some parts of the district a considerable amount of trespassing has been taking place, as the people prefer to cut timber without license and pay the fines for

doing so, if caught instead of obtaining licenses and complying with the regulations of the Bureau of Forestry. In order to stop this, a number of licenses have been made exclusive so as to give the holders the benefit of section 26 of the Forest Act which provides for the seizure of timber cut illegally in the district of an exclusive licensee. Minor forest products are of special importance in western Pangasinan (firewood) and in Zambales. From the latter province a considerable amount of rattan has been exported to Manila.

Although the free-use privilege is of great benefit to the people, as it enables them to cut free all building materials for their houses, it is still detrimental to the public forests as it is abused considerably. In many cases timber is cut under the pretext of being for personal use and afterward sold. In other cases great waste is committed in squaring timber. This latter abuse can somewhat be controlled in the communal forests, but it makes the supervision of cutting areas extremely difficult, as forest officers are hardly ever able to ascertain by whom a certain waste has been committed. Much attention has been paid to the suppression of illegal caiñgins. Many of them were reported to the provincial fiscals and in most cases convictions have been obtained.

As the public roads in some parts of this district have recently been improved considerably, a motorcycle has been placed at the disposal of the forest officer stationed at Dagupan and by its use a considerably increased amount of work in the inspection of cutting areas and homesteads has been made possible.

DISTRICT NO. 5, WITH HEADQUARTERS AT LOS BAÑOS, LAGUNA.

All of the lumbering operations in this district are carried out on a small scale, using only the most primitive methods of hand and animal logging. The policy of the Bureau of Forestry of reducing the cutting area granted under any one license to such a size as can be successfully handled by the licensee has been carried out in this district more than anywhere else. Each licensee has been allotted a definite area. Whenever possible, natural boundaries have been used. Where natural boundaries are not clear, many of the areas are definitely marked on the ground, the boundary marks being placed on trees with white paint. This method helps considerably in preventing friction and boundary disputes between different licensees.

In order to definitely locate areas in the office, base maps containing all available information are kept. Each license as it is granted is marked on the map and a small sketch of the area shown on the base map accompanies the license. No two

licensees for the same class of product are allowed to operate on one area. An area may be occupied by two or more licensees, but each one is removing a product different from the others. One map is used solely for locating timber licenses and another for minor products.

In order to enable the largest number of people to make use of the public forest, more information must be obtained. The compartment surveys which have been made in Tayabas have proved to be a great help in granting licenses in that region. Not only are there definite boundaries, but there is definite information as to whether or not the area is sufficient to meet the needs of the licensee and at the same time to maintain its present productiveness. The only additions to the compartments laid out last year are in Laguna and Batangas Provinces. This work has all been done as school work by students, but it has been put into actual practice in the district.

Almost without exception the violations which have been reported are small. The licensees have apparently tried to carry out the terms of their licenses.

The market conditions are poorer than they have been in the past. Operations have been reduced by many licensees this year because they have been unable to dispose of their products. Part of this may be due to the fact that the lumber manufactured by the larger companies is finding its way into the more remote places, but most of the operators claim that the European war is the cause of the depression. This has its effect on the class of products removed. Only the better specimens of the more valuable species are sought, so that in places these more valuable species are in danger of being eliminated. Where such conditions exist, the cutting of certain species has been prohibited.

The entire portion of the Maquiling Forest Reserve in Batangas Province was surveyed and mapped by the present Senior class of the Forest School. This work, together with that done by the students in the past, has been put in available shape so that there is a provisional compartment survey map of a large part of the Maquiling Forest Reserve and the whole of the Calamba Estate Addition.

The abuse of the free-use law is, without doubt, quite general. The establishment of communal forests has reduced this abuse somewhat, but until some of the recommendations already cited are put into effect and an adequate patrol maintained, the total yearly amount of timber and forest products stolen will be large.

The rangers are continually reporting that certain individuals have timbers under their houses claiming that they were to

be used for personal use. This statement is the natural one for them to make and it is hard to disprove it. Nevertheless, it has been noted that in the course of time the timber disappears and whether it has been legitimately used, sold, or stolen no one either knows or will say.

The only parts of the district which are comparatively free from the abuse of free-use privilege are parts of Laguna (northern part), Mount Maquiling Forest Reserve, and the Tayabas Forest Zone. In these places there are guards patrolling continually. By keeping in constant touch with the licensees and by knowing who are removing products without permit, they can quite readily check up products found in barrios.

Caiñgins.—It is believed that the increase in the number of caiñgins reported during the present year is a result of the increased activity on the part of the rangers rather than of the increase in number of caiñgins. There should be a decrease next year because of the large number of talks given by rangers. The increased number of homestead applications during this year, especially in Tayabas, is due to the vigorous action taken against caiñgineros by the provincial fiscals and the justices of the peace. Eighty-four caiñgins were reported in the district, the total amount of ordinary and additional forest charges on the timber destroyed being ₱11,743. Some of the provincial fiscals, especially the fiscal at Tayabas, have shown greater activity than before. Very few cases have been returned without a conviction having been obtained. Also the fines which are being imposed are usually equal to the amount of the corresponding forest charges.

Maquiling Forest Reserve.—Although this reserve is under the jurisdiction of the division of investigation, all of the administrative work is handled by the district forester. All products removed from the forest are taken under license or permit. There are several licenses for timber and firewood in the reserve. These are carefully located and a close check is kept on the amounts removed. All of the products taken for personal use under gratuitous or ordinary licenses are marked by the forest guards.

Some of the species of trees on the mountain are nearing exhaustion. In order to prevent their exhaustion they have been listed as species to be favored. They are not granted to people for personal use under gratuitous license. Their use is not prohibited, however, and they can be obtained by paying ordinary charges.

The trail work within the reserve is carried on by the division of investigation under the direction of the district forester.

No new trail work was done this year. The only work attemped was the repairing of existing trails. It is hoped that during the coming year money will be available for relocating and rebuilding the present horse trail near the top of the mountain. If not relocated, it will have to be rebuilt to make it passable. Several land slides occurred during the recent typhoons which destroyed parts of the trail.

The forest reserve is the only forest left in the vicinity and is, therefore, an important source of forest products. It is used as or instead of a comunal forest by the people of four municipalities.

The old abaca plantation has been turned over to the College of Agriculture. It is their intention to experiment with several species of abacá.

Three grazing permits on Mount Maquiling have been issued during this year. Only the cogon areas are utilized for grazing and these only at certain times of the year.

The ipil-ipil planting has been quite successful, but the conditions under which the planters were required to work were not satisfactory. As a result, they planted up their areas and then moved off of the estate because they were not making any money and not a sufficient crop to pay them for their trouble. It was considered advisable to offer the people some inducement to break up new areas, so the length of time in which they could work the land was increased. The other conditions are the same as before. As a result of this change, most of the people who moved away have returned to break new areas and many others have requested permission to break up cogon areas. Instead of planting ipil-ipil over the whole area, the planting of teak is contemplated.

The greatest change that has taken place in the district during the past year was the separation of the Island of Mindoro, which now forms a separate district. A new forest station was established at Infanta, Tayabas, and another station will be established in the near future at Unisan, Tayabas.

The conditions at the district office are much better than before. The office was moved into larger and better-arranged quarters. The progress and base maps are much more complete and fewer boundary disputes between licensees are to be expected.

DISTRICT NO. 6, WITH HEADQUARTERS AT NAGA, AMBOS CAMARINES.

Although the general depression of the lumber market had its effect also on the licensees of this district, it was not felt very strongly, as most of the licensees supply the local market,

which was rather good during the past year. Frequent inspections of cutting areas have resulted in a considerable decrease of violations which licensees often commit, such as cutting of high stumps and leaving merchantable material in the forest. Licensees frequently have come to the office of forest officers asking for inspection of their cutting areas so as to avoid violations. The general policy of the Bureau in regard to the conservation and utilization of the public forests is much better understood in this district than ever before, due to the large number of public talks given by forest officers during the year. During the latter part of the year, the district was visited by several unusually strong typhoons which did considerable damage to the forests and towns of the district. The forest station at Naga, the headquarters of the district, was entirely destroyed by one of the typhoons, and it was only due to the efforts of the rangers stationed there that most of the property and records were saved.

DISTRICT NO. 7, WITH HEADQUARTERS AT ILOILO.

Throughout the fiscal year 1915 there has been a general improvement in the lumber industry, as compared with the last semester of the previous year. At least in the city of Iloilo, there has been a marked progress due to the great demand in lumber for the construction of buildings for the stores in Calle Real and for other commercial and industrial purposes. In Iloilo, the yards of several lumber dealers have been enlarged and two new firms were organized during the year to engage in the lumber business. These facts show that the lumber industry is increasing. In Negros the demand for timber was great, mainly for the construction of hacienda buildings. Although much of the material used was mill-sawn lumber, a considerable amount was bought from local lumber dealers, mostly small licensees throughout the Island of Negros.

In Capiz Province, the timber licensees have shown some activity, but as they are small operators with only a little capital, they were not able to extend their business. Much of the timber was made into bancas.

Great activity is also shown by the firewood licensees in this district. Those from eastern Capiz, northern and southern Negros, and northern Iloilo supplied the great demand for rajas in Iloilo. Those in northern Capiz sent theirs direct to Manila, as there are two regular steamers calling at New Washington to load rajas and rajitas for Manila. In San Carlos and Kabankalan, Occidental Negros, the supply of rajas was sold mostly to the sugar central mills.

Good results have been obtained from the inspection of cutting areas. Much attention was paid to timber licenses for over 50 cubic meters. A good many license areas were inspected twice and several three or four times, but all except those for less than 50 cubic meters were inspected at least once during the fiscal year. Few violations were detected, many of them being the abandoning of merchantable tops in the cutting areas. This happens mostly in small licenses, because the licensee accepts orders for a definite length and size of timber before he begins cutting. Therefore, when he cuts a tree, he utilizes only such part or length as called for in the contract, in all cases where the whole length of the merchantable bole of the tree is not double the required length.

A new forest station has been established at Ilog, which improves decidedly the administration of southern Negros. Another station will be opened at Calivo, Capiz, during January, 1916.

DISTRICT NO. 8, WITH HEADQUARTERS AT ZAMBOANGA, MINDANAO AND SULU.

The work and influence of the Bureau of Forestry has continued to spread through the district during the year with the continuation of the policy of establishing ranger stations at various points. This brings the forest officers in closer and more constant touch with the people throughout the scattered settlements and enables the people to better understand the aims and policy of the Bureau, as well as to aid the Bureau in carrying on its work. In addition to the two stations established last year at Surigao and Kolambugan, new stations have been established at Naga-Naga and Port Banga, Zamboanga Province; Cotabato, Cotabato Province; and Davao, Davao Province.

Lumbering.—Little progress has been made during the past year in the improvement of conditions for the lumbermen.

Since the closing of the European markets by the war, they have depended largely on local markets for the sale of lumber with a few orders from China and the United States.

Their work since that time has not been steady, but has not entirely ceased. Several of the companies are making attempts to introduce their lumber into the United States and to develop a market there for their export grades. The display of lumber and manufactured articles in the Bureau exhibit at San Francisco has already brought inquiries regarding prices and grades to the lumber companies of this district, and it is to be hoped that the American interest in lumber from these Islands will continue to grow.

License inspection has been directed most intensively toward the larger operators who have sawmills, in order to keep check

on their woods operations and keep the workmen reminded of the instructions which the rangers have given them concerning the forest regulations. Until the Bureau has sufficient men to carry on this work in a proper way, the keeping of a good check on the larger operations is more beneficial than to try to keep a continuous check on all licensees. An effort is made to inspect all licenses granted at least once during the year, and while this has not been completely carried out, a fair check has been kept on the woods operations so that both small licensees have been checked on their work and nonlicensees have been penalized.

The general feeling of the lumbermen toward the Bureau is good and they are willing to coöperate in its work as much as possible.

During the past year the mills have had to depend on the markets in the Philippine Islands to a very large extent for the disposal of their timber, obtaining orders in Cebu, Iloilo, and Manila in order to keep their mills running. Small orders in Zamboanga, Cotabato and Glan have also helped to carry the mills along. However, the local demand is not sufficient to keep all the mills operating profitably and the development of an export trade to the United States and China, until the European market is opened again, must be looked to for improving the present market conditions.

The violations of the Forest Act and Regulations found are cutting without license, cutting undersized trees, leaving high stumps, and leaving long tops and logs in the woods. Such timber and wasted material have been invoiced and most of the charges collected. In several cases of abandoned logs, where the operators have shown good faith in their intentions of taking out the logs as soon as possible, and have made it reasonably clear that the logs have only been left due to the present lack of business in the mill, the charges have been temporarily suspended. As a rule, the violations have been small and the licensees have shown willingness to comply with the Bureau's regulations, so that with a constant inspection of the work and instruction of the workmen by the rangers these violations should be done away with. The activities of the rangers in the more settled parts of the district have brought the attention of the people to the necessity of obtaining licenses for timber and the prosecution of several offenders has resulted in many people coming to inquire about licenses and to make applications, especially for personal use.

The number of minor-products licenses granted during the year is greater than for the previous year, but the number of permits for the different classes of products is less, which would

seem to indicate that the licensees are confining themselves to the collection of a more limited variety and are specializing in certain kinds.

The land inspection work has doubled this year over that of last year and the increased work in connection with this, without a proportionate increase in ranger force, has seriously interfered with proper attention to other work.

Caiñgins.—During past years the chief effort in supervision of caiñgin work has been directed toward warning the people against this practice and inducing them to settle permanently on good homestead land. Throughout a large part of the district it is necessary to be lenient and careful with the offenders as, instead of settling down after a warning, they are apt to become frightened and go further into the interior where they will not be discovered and there renew their caiñgin work unhindered. However, in several better-settled regions where the people should know the regulations and where numerous warnings have been issued, a number of offenders have been brought up before the court and fined during the past year. Cases were made out and filed with the fiscal against 36 offenders in the Province of Misamis and against 20 offenders in the Province of Zamboanga. Several more cases have been inspected recently and they will be filed with the fiscal as soon as the reports are prepared.

In the wilder and more remote regions, the rangers have continued to take up this question with the people, showing them the advantage of taking up a permanent homestead and warning them against further violation of the law. In many cases the poorer people among the Moros and other wild tribes have expressed their willingness and desire to take up a homestead, but complain of their difficulty in keeping out the cogon grass with the few instruments they have for cultivating the land.

Caiñgin permits are issued to these people where good forest land will not be damaged and generally with the understanding that they will homestead the land and live there permanently.

The transportation and mail facilities in the district continue to be slow and uncertain, especially with Davao Province and the northern coast of Mindanao. Once or twice a month is the average connection with these stations.

Mail connections with Manila have recently been improved by the placing of one commercial boat on a scheduled run between Manila, Zamboanga, and Jolo.

Water transportation continues to be the chief mode of travel, because of the lack of roads through the greater part of the district. In many places this means much delay and uncertainty, because of the lack of scheduled boats or the long periods between

trips and the difficulty that is often encountered in securing vintas from the natives. The Bureau has improved these conditions for a number of the stations by supplying the launch *Montero* for the district office and two vintas for ranger stations.

This scattering of the rangers through the district, where they will be more constantly in touch with the people, is the most beneficial plan the Bureau has adopted and the great necessity now in carrying out the work is the furnishing of a larger ranger force to handle it.

DISTRICT NO. 9, WITH HEADQUARTERS AT PUERTO PRINCESA, PALAWAN.

The Province of Palawan, which is identical with district No. 9, contains a very large percentage of forest and the lumber industry, including the collection of minor forest products, is the most important industry of the province. The greater part of Palawan and the adjacent islands is covered by Bureau of Forestry licenses. There are, however, no operations which are carried on in a modern way. All licensees still use the primitive logging methods, and confine their operations to those few species which bring a high price in the Manila market.

In spite of the European war, which caused a decrease in the price of lumber and likewise in the demand, the licensees of the district have maintained the same activity as in former years. Calantas, ipil, acle, and narra are the species being logged, as they are the ones most demanded.

During the frequent inspections of the different cutting areas only very few violations of the Forest Regulations were observed. Few of the licensees of this district run their business with their own capital. Most of them are supported by capitalists in or outside of the province. Disposing of but little capital they, of course, are unable to introduce modern equipment for their use; for this reason they have to be content with what they can obtain. Yet the licensees of the district have done much toward improving their working outfits.

It is gratifying to report that perfect harmony exists between the representatives of the Bureau and the forest users of Palawan.

A better spirit toward the Bureau could not be expected than has been shown by the licensees of this district. They have always shown their willingness to coöperate with the Bureau in its campaign against illegal caiñgins, illegal collection of forest products, and against other violations of the Forest Act and Regulations. Occasional requests for assistance made to them by the Bureau or by its officers have always been complied with.

The minor forest products of special importance in this district are almaciga and rattan, the latter being found in large quantities in the higher mountains.

DISTRICT NO. 10, WITH HEADQUARTERS AT TACLOBAN, LEYTE.

The district of eastern Visayas (district No. 10) is composed of the Provinces of Samar and Leyte, and the Islands of Masbate, Ticao, and Burias of Sorsogon Province.

Although there is no marked progress in the lumber business in the district, it is safe to say that there is no decrease in the amount of timber cut this year. The demand for lumber is generally local and, with but very little exception, the licensees of Leyte do not export lumber to towns outside the island. The same is true of the Samar licensees. Licensees of Masbate, however, sometimes export some first-group timber to Manila and Iloilo. The classes of timber commonly cut by the licensees in the district are those of the dipterocarps and a little tiga and amuguis, the latter locally known under the name of sambulauan.

Every effort has been made to inspect each license area at least once during the year. License areas where operations in the woods are quite extensive were inspected more than once.

Transportation is quite well established between the islands comprising this district. During the first half of the year there has been weekly mail service between this office and the other two stations. This condition still exists between here and Catbalogan. This is also true of all the forest stations in the district and Manila. But between this office and Masbate the mail service is now fortnightly, only one steamer plying between the two places.

DISTRICT NO. 11, WITH HEADQUARTERS AT ORANI, BATAAN.

Special stress has been laid in this district on the suppression of illegal caiñgins and good results have been obtained. This is especially true in the jurisdiction of the forest station at Montalban. The mountains back of Montalban are inhabited by the so-called Monteses, descendants of people who had in former years left the civilized parts of the country, mostly in order to avoid punishment for some violation of the law. These people are accustomed to make caiñgins in the mountains of Montalban and so have destroyed large areas of good forest. Due to the united efforts of the rangers stationed at Montalban, the provincial governor, and the municipal president, these people have been induced to form settlements and to cultivate land which has been assigned to them by the forest officer. Caiñgin permits were issued and each family given a tract of land for cultivation. A number of these Monteses have recently applied for homesteads.

During the early part of the year the license agreement of the Cadwallader-Gibson Lumber Company was revised and fire-

wood and other minor forest products were excluded therefrom. This was done in order to give the residents of the municipalities concerned an opportunity to gather firewood and other minor forest products on a small scale. A number of licenses have been issued accordingly.

DISTRICT NO. 12, WITH HEADQUARTERS AT CALAPAN, MINDORO.

The general depression of the lumber market has especially been felt in this district and only a few of the licensees have shown any activity at all. One licensee has removed over 3,500 cubic meters of timber which has been used exclusively for the manufacture of matches by the Philippine Match Factory. Another licensee has exported about 400 cubic meters of first and second group timber. All others have supplied only the small demand of the provincial trade and made small shipments to the Province of Batangas. It is the opinion of the officer in charge of this district that the Free Use Law is abused to a great extent. Mindoro has almost no roads and very poor communications, so the general supervision is extremely difficult. Consequently a large amount of bancas and timber which is cut under the pretext of being for personal use is shipped and sold in Batangas and other provinces. It is hoped that the establishment of a new station at San José in the southwestern part of the island will tend to stop this illegal timber traffic to some degree.

DIVISION OF INVESTIGATION.

During the past, the work of the division of investigation had been carried on along two main lines, investigation and education, the latter consisting of the supervision of and instruction in the Forest School at Los Baños. This arrangement has, however, not proven most satisfactory, as it exclusively absorbed the time and attention of the members of the division, thereby preventing their carrying on investigative work of prime importance to the proper conservation and utilization of the forest resources of the Philippines. Therefore, during the new year, all Bureau activities in reference to the Forest School will be conducted under the immediate supervision of the Director of the Bureau, which arrangement, it is believed, will result in an increase of efficiency. The headquarters of the division of investigation, which has hitherto been maintained close to the Forest School at Los Baños, will probably be transferred to the Manila office, and the major portion of its time will be spent on investigative work, particularly the preparation of an inventory

of the amount and uses of the minor forest products of commercial importance. Among the results of the Bureau of Forestry exhibit at the Panama-Pacific Exposition, none was more important than the awakening of the attention of United States commercial firms to the great number of minor forest products in the Philippines, products in which such firms would be interested if reliable data were available as to their distribution and abundance, whereas so far only certain foreign firms have been induced to handle them on a large scale. To supply such data will be the main work of the division of investigation during the coming year.

REPRODUCTION STUDIES.

The reproduction plots which have previously been laid out in the cutting areas of the Cadwallader-Gibson Lumber Company in the Province of Bataan have been examined twice during the year. These studies have not as yet been carried on long enough to give conclusive results, but two facts seem to be; (1) That light fires which ran over the cutting area immediately after cutting have a rather beneficial result on reproduction, provided sufficient trees have been left; and (2) that dipterocarps, which form the most important part of our commercial forests, will reproduce sufficiently under proper conditions. These studies will, of course, be continued.

GROWTH STUDIES OF FOREST TREES.

This work was started in 1914. The measurement of 594 trees of eight different species have been taken. Periodic measurements have been continued during the year, and the forester in charge of this work submitted a report which shows interesting facts concerning the growth of these trees. It appears that some species have two periods of rapid growth during the year. This work also will be continued.

STUDENTS' THESES.

Two graduates of the Forest School who took the higher course prepared theses, one on the effect of girdling trees and the other a proposed working plan for a part of the northern Laguna forest in the vicinity of Paete. It has been found that some of the forest trees show remarkable powers of recovery after having been girdled, especially catmon and tamayuan. Also a number of parang species very readily healed over.

The working plan of the northern Laguna forest is accompanied by a very complete map which will be of great use in the administrative work of the district.

FOREST PLANTATIONS.

The following table shows the amount of nursery work performed during the year 1915:

Area of the nursery	square meters	6,324
Total number of species planted		108
Total number of species handled		179
Total number of seeds sown		544,868
Total number of plants obtained		15,204
Per cent of plants obtained		2.79
Average per cent of germination		15.98
Total number of plants set out		12,480
Total number of plants transplanted to nursery rows		12,967
Total number of plants put in bamboo pots		4,315

Compared with the year 1914, we have sown 110,824 seeds more this year. This great increase in the number of seeds sown was due to the fact that there were many seeds in the storeroom which, if not planted within the year, would either lose their vitality or rot before the next sowing season. The percentage of plants obtained this year is very much lower, however, than last year, the difference being 5.23 per cent. The average per cent of germination for the two years remains practically the same, the increase of this year being 0.9 per cent.

The decrease in the percentage of plants obtained may be accounted for by the following causes:

1. A great number of short-lived seeds were received just before the beginning of the dry season. These were sown at once, but when they were germinating, the water supply was cut off because of the repair to the water system. Great effort was made to water the seedlings by carrying water from the Mulawin Creek, but this was not as effective, because of its inadequacy, as the water supplied by the faucets.

2. Most of the seeds sown had been stored for a long time. Many of these failed to germinate.

3. A number of seeds were planted late in November and during the early part of December. Most of these seeds have not yet germinated or have only just begun to germinate.

TRANSPLANTING STUDIES.

The time favorable for transplanting this year was about two months later than last year. The planting was started during the latter part of May, 1914, but not until the latter part of July, 1915.

The cheapest and the simplest method of transplanting, which is the bare root system, was used this year. In most cases, delicate seedlings which were too crowded in the seed flats and too small also for the nursery rows were put in bamboo pots. For this year, the total number transplanted to the nursery

rows was 12,967 and in bamboo pots 4,315. The use of the bamboo pots increases the cost about 2 centavos per plant, but the per cent of plants obtained is larger than in the nursery rows.

Rainfall has always been watched for as the basis of our transplanting work. Beside this, the age and size of seedlings are also considered. This is in continuation of studies made last year.

ROOT DEVELOPMENT AT DIFFERENT AGES.

The study of the root development of seedlings at different ages is one of the necessary studies to be carried on in connection with transplanting work. For this purpose a considerable number of seedlings were dug up again this year, and both their stem and root lengths were measured.

At present there are 144 different specimens of seedlings of different ages, representing 95 species, on file ready for either photographing or mounting. This is valuable material. Each specimen has been treated with preservative so as to be available for future reference. They are now only wrapped in paper and are, of course, exposed to danger. The value of this material has been thoroughly realized both in connection with our nursery operations and in the educational work of the students in Silviculture II. It should, therefore, be properly mounted and arranged in a suitable case. The mounting material has been requisitioned.

From the measurements of plants already dug up, the following species, arranged in order from longest to the shortest, appear to be deep rooted: Acleng-parang, narra, cupang, tindalo, lanete, duhat, banaba, palomaria de la playa, teak, calumpit, anagap, tanglin, dungon-late, and balacat-gubat.

The following appear to have short tap roots: Amuguis, dao, pili, kamatog, supa, *Swietenia macrophylla, Swietenia mahagoni,* white nato, and molave.

WORKING COLLECTION OF FOREST-TREE SEEDS.

The number of species in the museum is increasing every year. There are now 496 different species kept, being a gain of 39 species this year. The seeds kept for collection are either new species or have striking characteristics. The museum this year has been systematically arranged. In the past, the species were arranged alphabetically by families. This was used only for reference work.

In order to give an idea of the seeds and fruits of Philippine lumber trees, an arrangement has now been made in which the species are arranged by groups according to their commercial value. The bottles and shelves are carefully labeled and are

put in a prominent place in the office. The present arrangement is very satisfactory and the following results have been observed:

1. Visitors who inquire, especially those interested in forestry, can give their attention at once to the nature of the seeds of the desirable species.

2. It has enabled us to identify some seeds recently collected by reference to those previously identified.

3. It has greatly increased the value of the collection for the instruction of the forestry students:

(*a*) Students taking wood technology refer to the species arranged by groups.

(*b*) Students taking forest botany and Silviculture II make constant reference to the species arranged by families.

(*c*) The collection has materially facilitated the instruction of students in nursery and plantations.

SEED DISTRIBUTION.

As a result of the coöperative planting work begun by the Bureau last year, there was again a large amount of seeds requested this year. It is believed that the establishment of school nurseries and the frequent talks made by the different officers in the field have aroused the interest of many people in forest planting.

Often-times requisitions for seeds in large quantities came to our hands, but the amount sent was restricted for the following reasons: (*a*) The inadequate supply of seeds in stock for distribution and (*b*) the cost of shipment.

With every species sent there was also a copy of planting instructions. The amount by species of the seeds distributed or exchanged is shown by the following table:

1.	Ipil-ipil	liters	362.25
2.	Lumbang	do	175.00
3.	Teak	do	48.58
4.	Narra	do	40.00
5.	Ipil	do	9.57
6.	Acle	do	2.75
7.	Tindalo	do	2.90
8.	Molave	do	1.25
9.	Gogo	do	1.00
10.	Bunga de China	do	1.00
11.	Palomaria	do	.83
12.	Fire tree	do	.55
13.	Banaba	do	.35
14.	Bottle shaped gourd	do	.30
15.	Acleng-parang	do	.25
16.	Bombax ceiba	do	.25
17.	Swietenia Mahagoni	do	.12
18.	Lanutan I	do	.10
	Total	do	647.05

The above tabulation shows that there were 647.05 liters of seeds distributed and that ipil-ipil, lumbang, teak, narra, and ipil are the ones mostly desired. The first four species are very successful for planting work.

SEED EXCHANGE.

The system of exchanging seeds of native species for foreign species has enabled us this year to try a great number of exotics in the nursery. The rather large amount of *Cedrela odorata* and *Swietenia macrophylla* received has given us a good stock of seedlings, which have been set out in the plantation side by side with our native tree, calantas, for the purpose of comparison.

EXPERIMENTS WITH CUTTINGS.

The experimental work with cuttings was more carefully done this year than last. There were 30 different species in all. The experiments were carried on with a much larger number of cuttings than ever before. The diameter classes ranged from 1 to 5 centimeters and over, using $\frac{1}{2}$-centimeter intervals. The experiment was started on June 26, 1915, and brought to a close on November 27, 1915. A weekly record of careful observations was made and the work appears to have been very successful.

From these experiments it has been ascertained that the following species can be propagated very successfully by cuttings: Molave, teak, hairy-leaf molave, tindalo, narra, balobo, tamayuan, lago, kalingag, malaruhat, liusin, banaba, anagap, and catmon.

GERMINATION TEST.

This year an experiment testing the germination of ipil-ipil was carried on. Five thousand fresh seeds were tested. The experiment began on October 22, 1914, and closed on April 17, 1915.

PROCESS.

A layer of sawdust about 10 centimeters was placed in a box 60 centimeters square. This was covered with a layer of blotting paper. The seeds were then scattered evenly, on top of the blotting paper, side by side. The seeds were kept constantly moist by sprinkling with water every morning and afternoon, or by covering with wet cloth. The box was put in a place where there was moderate light and where the wind was not strong. Every morning the seeds which had germinated were counted and removed.

RESULTS.

The seeds began to germinate after five days, and increased daily until the tenth day (from the first sign of germination) when there was a maximum germination of 242 seeds. This resulted from the application of a wet cloth on top of the box. From that time, the number of germinating seeds became irregular.

The experiment lasted for five months and twenty-five days. The total number of seeds which germinated was 1,119, therefore the per cent of germination was 22.38.

The same experiment was carried on by the students as a part of their instruction in nursery practice and the total number of seeds tested was 11,500. The total number which germinated was 2,706, therefore the per cent of germination was 23.52.

ROADSIDE PLANTING.

Roadside planting, in coöperation with the Bureau of Public Works, was started in June, 1914. At this time a distance of more than 1 kilometer from the college campus to the barrio of San Antonio was planted with lumbang and raintree, the trees being planted alternately 15 meters apart on both sides of the road. This work was a part of the student's work in nursery practice.

This year the dead plants were replaced by using seeds and cuttings. There are living at present 44 acacia trees, with an average height of 4.54 meters and an average diameter of 5.5 centimeters, and five lumbang trees, with an average height of 1.93 meters.

ARBORETUM.

About 29 new species have been planted in the arboretum, which brings the total number of species to about 180. The record of all these plants is being kept and measurements are taken from time to time.

DURABILITY TESTS.

The durability-test pieces were examined and reported on twice during the year. Additional pieces treated by the Powell Syndicate of London were included. A new preservative, Saums, was applied to some pieces of white lauan and these were also included in the test. All of the tested pieces which were formerly at Lamao, Bataan, have been transferred to the testing grounds

at Los Baños. They have been regularly examined. Five hundred and ninety pieces of wood, representing 192 different species, have been experimented with. It appears that molave, sasalit, yacal, dalingdingan, tindalo, ebony, and betis are the most durable.

MOUNT MAQUILING FOREST RESERVE.

IPIL-IPIL.

A large supply of ipil-ipil seeds has been furnished to the planters who had abandoned certain areas within the Calamba Estate Addition. Some of these areas are in very good shape at present, especially those that the planters have protected from stock. More has been said concerning this work in the report for the district. Ipil-ipil has been used freely in the plantation as a cover crop and around the plantation for fire protection.

ADDITIONS TO THE MAP.

The students during their summer instruction work took approximately 50 kilometers of trail notes. These notes have been compiled and the map of the entire Batangas block of the mountain revised. This is the block adjoining the Calamba estate block of which an intensive reconnaissance was made last year. This new section of the map of Mount Maquiling has already been made use of in granting licenses in the district.

FOREST SCHOOL.

The following provinces are represented by the 19 members in the senior class of the Forest School who are expected to graduate in March, 1916: Bulacan, Pangasinan, Isabela, Occidental Negros, Rizal, Zambales, Cavite, Nueva Ecija, Cagayan, Capiz, and Tarlac.

The junior class (22 students) represents the following provinces: Nueva Vizcaya, Batangas, Cagayan, Cebu, Ilocos Norte, Tarlac, Iloilo, Ambos Camarines, Capiz, Ilocos Sur, Rizal, Pampanga, and Pangasinan.

Seventeen students were given certificates in March, 1915, stating that they had completed the ranger course of study at the Forest School. Two students were conditioned and entered the Bureau as temporary employees until such time as they will be able to remove their condition. All the others were employed as rangers with salaries ranging from ₱50 to ₱60 per month. There are also 5 private students, 2 from Guam and 3 from China, who will finish their course during March, 1916.

CURRICULUM.

The course provided for the pensionados of the Forest School is as follows:

Junior year:
- Botany 2–A.
- Mathematics.
- Forest engineering I, first semester.
- Dendrology (forest botany).
- Physiography, soils, and climatology, second semester.
- Silviculture I, second semester.
- Forest engineering II, summer vacation.

Senior year:
- Wood technology, first semester.
- History, law, and procedure, second semester.
- Forest engineering III.
- Silviculture I.
- Forest management I.

During the past year the course leading to a degree has not been given and it is the intention of this Bureau to eliminate it also during the year 1916, as there are no rangers who have performed the required work of two years under the direction of the dean of the college. A number of rangers who have completed the ranger course have done such work during the present year and will continue to do so during the year 1916.

EQUIPMENT.

As stated elsewhere in this report, sufficient money has been allotted by the Philippine Legislature to finish the administrative building which was begun during the year 1915, and also to erect quarters for the pensionados of this Bureau. Both projects are badly needed. The temporary quarters which were built during 1910 when the school was first established have suffered so heavily during the typhoons which passed over Los Baños during the fall of 1915 that they will not be serviceable during the coming year.

VACATION WORK AND PRACTICE TRIP.

During April and May, 1915, the present senior class camped on that part of Mount Maquiling which is situated in Batangas and which was hitherto little known. The work performed by the students covered part of engineering, mensuration, and dendrology. A great deal of information was collected. During the spring of 1916 the present junior class will camp on the area drained by the Cambantoc River. This is the only part of Mount Maquiling which has not been worked over and when this block

is finished it will be possible to compile an up-to-date topographic map of the mountain.

During October the senior class was taken to the cutting area of the Cadwallader-Gibson Lumber Company in Limay, Bataan, for instruction in logging and milling. Following this trip they spent three days in Manila, studying the different wood-using industries and the collection of wood samples in the office of the wood expert of this Bureau.

DIVISION OF FOREST MANAGEMENT.

The division was organized on January 1, 1915, with the principal object of taking over complete control of the larger long-term license agreements and of fostering a better understanding between the Director of Forestry and the lumbering interests of the Islands. During the past year, this latter object has been constantly aimed at, besides taking up a few other projects, such as the campaign for extending the use of native woods, the active introduction of grading rules, putting into effect the new law for scaling timber in the round, preliminary work on an inspection squad, and various other work which has arisen in connection with these matters.

At present the division is composed of one forester as chief, two American field assistants, and a number of Filipino rangers, the latter being used in conjunction with the division of administration. Division headquarters are in Manila, while the two American field assistants have their headquarters at Cadiz, Occidental Negros, and at Limay, Bataan. The Filipino rangers are stationed at the various regular forest stations maintained by the Bureau. During the year, the division chief made field trips to Limay, Bataan; Los Baños, Laguna; Fabrica and Cadiz, Occidental Negros; Zamboanga and vicinity twice; and Kabibihan, Tayabas. He was absent altogether about six months and covered some 8,000 kilometers in travel. All these trips were made for the purpose of visiting and reporting upon lumbering operations at the places mentioned and in order to put into practical operation the new scaling law. Other work was accomplished on these trips, but was only incidental to their main object. Practically all of the larger operations were visited, beside a number of the smaller ones.

The work accomplished and the results obtained justify both the establishment of the division and the allotment to it of the lines of work already mentioned. Having experienced and practical men stationed at the larger operations to direct the affairs of the Bureau has resulted in a much better understanding between the lumbermen and the Bureau and has also made the

handling of the affairs of these companies much more satisfactory. Where it is required to inspect large logging and milling operations, a thoroughly practical man is necessary, as questions are continually arising which can only be solved satisfactorily on the spot. Having such men in the division is one of its chief assets, and I doubt the wisdom of maintaining the division without them.

CAMPAIGN ON THE USE OF NATIVE WOODS.

A study of customs records reveals to one interested therein the fact that in the past a great deal of timber and manufactures thereof has been imported into the Islands. I am glad to say that these figures of late years show a gradual reduction in the amount imported. It is for the purpose of reducing these figures to a minimum that this campaign was undertaken. Consequently this division investigated and reported upon the conditions existing and, without going into details here, it may be said that there seems to be much less reason than formerly for the use of imported woods for the purposes to which they have been commonly put. At the present time there is scarcely any reason why native woods should not fulfill all requirements as well or better than the imported ones. They have been tried out and have not been found wanting whenever the proper species was used in the proper place. The Government may and perhaps should lend its aid in this matter and there seems to be no adequate reason why the native woods should not be used in all Government construction work. If this is done, the private construction companies will soon fall into line and within a short time imported woods will be unknown. It seems no more than right that the Government should buy for its work a product on which it collects a Government charge, the money so derived being used to carry out that work. A little inconvenience may be experienced at first in getting used to the new woods, but it would seem wise to support home industry even if it costs a little trouble, especially now when the lumber market is in such a depressed state and needs all the help it can get.

LUMBERMEN'S ASSOCIATIONS.

An association properly formed and bound together is of inestimable value to its members, chiefly in that it has the voice of many instead of a single individual. It can advance the welfare of its members much more than these members can as individuals, as the word of such an association is much weightier. It can adopt and back up a set of grading rules, can make restrictions and regulations for the conduct of its members, and can much more easily bring about needed coöpera-

tion than can any individual. It can organize the industry and, if such an association had been properly organized before the outbreak of the war, it would have been of great value to its members during the present heavy market depression. The lumber industry in the Islands is notoriously disorganized and as a result the various companies undersell each other to such an extent that they often sell below cost. This condition puts the companies at the mercy of any buyer who may come along and avail himself of his opportunities.

The formation of the Mindanao Lumbermen's Association and of the Philippine Lumber Manufacturers' Association speaks very well for the future of the lumber industry of the Islands and it is sincerely hoped that the good work thus started will not stop where it is now. Grading rules and associations go together and in applying and guaranteeing the one, the other is necessary.

INSPECTORS.

When dealing with grading rules and the associations necessary to enforce them, the question of inspectors comes up. The laymen knows nothing of grading rules and consequently men who have specialized in this work are necessary. In order to meet this condition, the Director of Forestry initiated a movement to bring two Americans from the States, these men to be authorized inspectors familiar with the hardwood markets there. The carrying out of this project is to be assigned to this division and present plans are to give these men an opportunity, first of all, of becoming familiar with the Philippine woods. This accomplished, it is then planned to have them gradually train up a corps of Filipino inspectors. All these men are to be available to the lumber companies whenever they may wish a cargo inspected before shipping. They will also do all the inspection work for the Government. Thus the Government will bear the initial expense of this work, but it is expected that the associations later will take it up themselves.

LUMBER MARKET.

In the foregoing pages, I have made frequent allusions to the depressed condition of the lumber market and it may not be amiss to take up this subject here. There has been a decided depression brought about by a combination of a number of factors. Chief among these has been the European war, which has caused the abnormally high freight rates and great scarcity of bottoms. This came at a time when lumber was being produced in increasing quantities and was just beginning to move

out of the country. The export business was nipped in its infancy, which made the present depression all the more severe, as the companies did not immediately begin to curtail their outputs. Consequently, all this product was dumped onto an already stocked-up market and prices fell tremendously. If freighters could be gotten at reasonable rates, there is no doubt but what the market would immediately better itself, if not come back to almost normal. Here, however, it should be stated that it is my belief that the local market will never again see the high prices that obtained before the depression.

CLERICAL WORK.

Notwithstanding the fact that the activities of the Bureau were very materially increased during the year by the creation of a new division, by the addition to the field staff of the graduating class of the Forest School, by the opening of new forest stations, by the large increase of inspection work, and by the installation of a number of special projects (all of which add considerably to the clerical work of the Bureau), the clerical force has been reduced considerably and at the same time has maintained the previous high standard of efficiency in the work performed. A very important step was taken in the interest of Filipinization in that two of the three American clerks resigned and the greater part of their work has been absorbed by Filipinos. The American stenographer resigned and a strong effort is being made to use Filipino stenographers already in the Bureau, employing additional assistance only temporarily as needed. About two years ago, four Americans were employed in the Bureau and, despite the fact that during this time the activities of the Bureau have more than doubled, necessitating a corresponding increase in clerical work, the number of four has now been reduced to one, this one, the chief clerk, devoting but part of his time to purely clerical supervision. This is a record in which the Bureau can justly take pride. It is believed that no other technical and administrative Bureau in the Government has been able to make such a showing. Too much cannot be said of the application and progress made by the Filipino clerks in the Bureau and it is much to be regretted that the Legislature did not see fit to give to them the recognition of which they are so deserving. Even though every effort is being made to simplify and systematize the clerical procedure of the Bureau, the present force is very inadequate to conduct the clerical work promptly and efficiently, but it will be possible by the present appropriation to appoint two or three Filipino clerks of very small salaries to relieve to a certain

degree the high tension under which the force is working. It was necessary for the clerical force to do considerable overtime work during the year, which work was always done cheerfully in spite of the fact that almost without exception the Filipino clerks are attending night schools, a practice the Bureau has always encouraged in order to raise the general level of knowledge and efficiency of the office staff.

FOREST RECONNAISSANCES.

THE VALLEY OF THE AGUSAN RIVER.

The most important reconnaissance undertaken during the year was that of a part of the Agusan Valley in the northern part of the Island of Mindanao. A detailed report on this reconnaissance, which was made under the supervision of a member of this Bureau who is not sufficiently familiar with English to submit his report in that language, has been prepared in Spanish and is being published as a special circular. A short abstract of this report is here given, comprising those points which are of special interest to foresters and lumbermen:

The Province of Agusan lies between latitude 8° and 9° 31′ north and longitude 125° 7′ and 126° 15′ east of Greenwich. It is bounded on the north by Butuan Bay and the Province of Surigao, on the east by the Province of Surigao, on the south by the Province of Davao, and on the west by the Provinces of Bukidnon and Misamis. The greater part of the province is a broad valley inclosed by two mountain chains, that of the east central range and that of the east coast range the latter extending inland and southward to the Gulf of Davao. The northeast part of the province is a separate and smaller valley formed by the Tubay River, which rises from Lake Mainit, a small body of water forming part of the boundary between Agusan and Surigao. The mountain chains mentioned are sierras whose highest peaks rise from about 300 to nearly 2,000 meters (1,000 to 6,000 feet) above sea level. The northwest part is separated from both of these valleys, being formed by a series of ridges rising gradually from a narrow coastal plain to the crests of the sierra. The total area of the province is about 11,730 square kilometers (4,529 square miles), of which approximately 10,000 square kilometers are estimated to contain commercial forest. Detailed studies were made covering an area of approximately 135,000 hectares of forests. Valuation surveys were made over 465 hectares selected in 13 different compartments. The condensed results of these valuation surveys are shown in the following table:

Volume in cubic meters per hectare, board feet per acre, and percentage of different species, in Blocks I to XIII.

BLOCK NO. I, 6,000 HECTARES.

Name.	Amount per—		Per cent.
	Hectare.	Acre.	
	C. m.	*Bd. ft.*	
Lauan[a]	15.78	1,578	24.89
Apitong	15.61	1,561	24.63
Yacal	5.28	528	8.40
Taluto	3.88	388	6.16
Ilang-ilang	2.25	225	3.59
Binuang	1.83	183	2.58
Malaikmo	1.17	117	1.89
Lanipau	.87	87	1.38
Gubas	.84	84	1.32
Molave	.80	80	1.29
Guijo	.68	68	1.08
Narra	.64	64	1.01
All others	14.56	1,456	21.78
Total	64.19	6,419	100.00

BLOCK NO. II, 5,000 HECTARES.

Apitong	15.23	1,523	34.20
Lauan[a]	5.47	547	12.30
Lanipau	4.73	473	10.63
Yacal	3.12	312	7.01
Molave	1.07	107	2.41
Batete	1.05	105	2.36
Amugis	.96	96	2.16
Guijo	.77	77	1.73
Narra	.73	73	1.64
Malaikmo	.72	72	1.62
Tanguile[b]	.63	63	1.40
Dao	.51	51	1.15
Camagon	.49	49	1.11
All others	9.02	902	20.28
Total	44.50	4,450	100.00

BLOCK NO. III, 5,500 HECTARES.

Lauan[a]	22.31	2,231	25.09
Apitong	17.52	1,752	19.70
Tanguile[b]	15.00	1,500	16.96
Red lauan	11.48	1,148	12.91
Toog	3.96	396	4.45
Lanipau	3.51	351	3.98
Amugis	1.46	146	1.65
Yacal	1.31	131	1.48
All others	12.28	1,228	19.29
Total	88.83	8,883	100.00

BLOCK NO. IV, 8,000 HECTARES.

Name.	Amount per—		Per cent.
	Hectare.	Acre.	
	C. m.	*Bd. ft.*	
Toog	28.71	2,871	21.60
Lauan[a]	27.35	2,735	20.58
Red lauan	19.83	1,983	14.92
Apitong	19.03	1,903	14.32
Tanguile[b]	14.07	1,407	10.68
Lanipau	4.31	431	3.23
Gubas	2.61	261	1.96
Narra	1.41	141	1.06
Anubing	1.34	134	1.00
All others	14.06	1,406	10.65
Total	132.72	13,272	100.00

BLOCK NO. V, 12,000 HECTARES.

Apitong	91.38	9,138	50.15
Lauan[a]	25.11	2,511	13.74
Tanguile[b]	18.97	1,897	10.25
Toog	8.59	859	4.70
Yacal	7.65	765	4.20
Guijo	4.54	454	2.49
Lanipau	3.76	376	2.06
Red lauan	2.71	271	1.49
Narra	1.00	100	1.09
All others	18.01	1,801	9.83
Total	181.72	18,172	100.00

BLOCK NO. VI, 10,000 HECTARES.

Apitong	73.90	7,390	41.27
Tanguile[b]	26.09	2,609	14.57
Lauan[a]	17.62	1,762	9.84
Toog	16.26	1,626	9.08
Yacal	11.61	1,161	6.49
Red lauan	10.22	1,022	5.70
Lanipau	4.79	479	2.67
Narra	2.78	278	1.55
All others	15.82	1,582	8.83
Total	179.09	17,909	100.00

[a] Under lauan are included four species, namely, almon, bagtican, mayapis, and white lauan, as well as small amounts of certain other species known only by local names and not yet specifically determined. Their quantity is unimportant, and in character they are like the light-colored lauans above named.

[b] Under tanguile are included balakbakan, malagangau, saplid, and ubanan, species of *Shorea* not specifically determined; see remarks about these on p. 57.

Volume in cubic meters per hectare, board feet per acre, and percentage of different species, in Blocks I to XIII—Continued.

BLOCK NO. VII, 8,000 HECTARES.

Name.	Amount per—		Per cent.
	Hectare.	Acre.	
	C. m.	*Bd. ft.*	
Lauan[a]	61.23	6,123	47.65
Apitong	16.76	1,676	13.05
Yacal	11.36	1,136	8.84
Mancono	9.23	923	7.19
Tanguile[b]	8.78	878	6.83
Sudiang	5.44	544	4.23
Tiga	4.54	454	3.53
All others	11.16	1,116	8.68
Total	128.50	12,850	100.00

BLOCK NO. VIII, 10,000 HECTARES.

Apitong	30.77	3,077	34.80
Lauan[a]	21.86	2,186	24.74
Red lauan	9.92	992	11.07
Lanipau	3.91	391	4.43
Yacal	2.66	266	3.16
Guijo	2.10	210	2.37
Ilang-ilang	1.43	143	1.64
Malugay	1.36	136	1.56
Malaikmo	1.35	135	1.52
Tanguile[b]	1.32	132	1.49
Gubas	1.25	125	1.42
Narra	1.12	112	1.28
Nato	.89	89	1.03
All others	8.32	832	9.47
Total	88.26	8,826	100.00

BLOCK NO. IX, 4,000 HECTARES.

Apitong	21.04	2,104	41.46
Lauan[a]	11.47	1,147	22.61
Red lauan	5.48	548	10.79
Lanipau	2.96	296	5.83
Tanguile[b]	1.33	133	2.62
Toog	.98	98	1.93
Narra	.92	92	1.80
Yacal	.85	85	1.68
Anubing	.74	74	1.45
Amugis	.53	53	1.07
All others	4.44	444	8.76
Total	50.74	5,074	100.00

BLOCK NO. X, 6,000 HECTARES.

Name.	Amount per—		Per cent.
	Hectare.	Acre.	
	C. m.	*Bd. ft.*	
Lauan[a]	21.61	2,161	27.74
Toog	21.26	2,126	27.29
Apitong	15.88	1,588	20.39
Red lauan	4.07	407	5.27
Tanguile[b]	3.52	352	4.51
Lanipau	2.24	224	2.86
Balacat	1.17	117	1.51
Narra	.96	96	1.23
All others	7.19	719	9.20
Total	77.90	7,790	100.00

BLOCK NO. XI, 50,000 HECTARES.

Toog	24.13	2,413	23.40
Apitong	23.41	2,341	22.71
Lauan[a]	17.07	1,707	16.55
Red lauan	7.31	731	7.09
Tanguile[b]	5.88	588	5.70
Narra	4.61	461	4.47
Lanipau	3.15	315	3.06
All others	17.85	1,785	17.02
Total	103.33	10,333	100.00

BLOCK NO. XII, 6,000 HECTARES.

Red lauan	25.18	2,518	44.05
Tanguile[b]	11.79	1,179	20.64
Apitong	9.55	955	16.70
Yacal	5.38	538	9.41
All others	5.26	526	9.20
Total	57.16	5,716	100.00

BLOCK NO. XIII, 3,500 HECTARES.

Pototan	52.60	5,260	64.85
Tabigi	21.88	2,188	26.97
Ipil	1.77	177	2.18
Bacauan	1.69	169	2.09
Pagatpat	1.42	142	1.93
Dungon-late	1.27	127	1.56
Tuwi	.34	34	.42
Total	80.97	8,097	100.00

[a] Under lauan are included four species, namely, almon, bagtican, mayapis, and white lauan, as well as small amounts of certain other species known only by local names and not yet specifically determined. Their quantity is unimportant, and in character they are like the light-colored lauans above named.

[b] Under tanguile are included balakbakan, malagangau, saplid, and ubanan, species of *Shorea* not specifically determined; see remarks about these on p. 57.

The compartments were selected in reference to natural boundaries and are outlined on the map reproduced in this report. Prospective licensees can form therefrom an idea how much merchantable lumber will be available in any one of these compartments or in any combination of several compartments.

PHILIPPINE ISLANDS

NORTH COAST OF MINDANAO

AGUSAN RIVER ENTRANCE

BUTUAN BAY

Humilok R.

Panataiyan R.

Mambotoa R.

Taodoy R.

Baskan R.

Pigutit R.

Mayasina R.

Tunasmpit R.

Badyangon R.

Bahan R.

Ligay R.

Montangie R.

Bogong R.

Abohan R.

Tasiton R.

Saotan R.

Asido R.

Ambago R.

Abayon-on R.

Langihan R.

Agusan Pequeño R.

Agusan R.

Pontod I.

Pilots

Sagpod I.

Tortosa

Conspicuous clump of trees

The entrance to the Agusan River is usually marked by two bamboo poles placed by local pilots

Libertad village 1½ hrs. up river in canoe.

Currents at entrance: As far as observed the current flows out of the river at all tides.

The river is lowest during September and October. The rainy season is from November to February. During floods the river rises from 12 to 36 feet

Fresh water at all tides

Butuan

Cathedral

Light

Nasipit

Lt F 20ft 7mi

Lt Fl 20ft 7mi

24° true

VARN 1° 46' E. IN 1912 ANNUAL INCREASE 7'

HEIGHTS in feet above high water for light houses, above mean sea level for other features

TIDES	Agusan River Entrance	Nasipit Harbor
High water interval	11h 30m	11h 25m
Higher high water height	3.8 ft.	4.1 ft.
Lowest tide	-1.5	-1.8.

ABBREVIATIONS

Lights: F fixed, Fl flashing, Occ. occulting, W. white, R red.
Buoys: C can, N nun, S spar.
M mud, S sand, Co coral, hrd hard, sft soft, rky rocky.

AUTHORITIES

Original surveys in 1910
Additions from U.S. Navy in 1905

SOUNDINGS IN FEET
AT MEAN LOWER LOW WATER

Scale

Nautical Miles

Yards

Kilometers

Washington, D.C.
COAST AND GEODETIC SURVEY
September 1911

125°20'

BUTUAN BAY

Nasipit

VARN 1° 46' E. IN 1912 ANNUAL INCREASE 7'

PHILIPPINE ISLANDS

NORTH COAST OF MINDANAO

NASIPIT HARBOR

Surveyed in 1910

SOUNDINGS IN FEET
AT MEAN LOWER LOW WATER

½ Nautical Mile

Kilometer

Yards

Only trees with a diameter of more than 40 centimeters were measured.

FORESTS.

For the present purpose, the vegetation of the region is divided into four types: Commercial forest, noncommercial forest, cultivated lands, and open or grass lands. Beside these there are some small areas of mangrove swamp forests.

"Commercial forest" is that which contains sufficient timber to justify the establishment of a large lumbering enterprise, and "noncommercial," that which could not sustain such an industry, but can supply enough timber for local uses or for small logging operations.

The following table shows the relative areas of each type and their relation to the whole area of the province:

Type of vegetation.	Hectares.[a]	Acres.	Per cent of area of province.
Commercial	1,042,000	2,514,782	88.33
Noncommercial	60,000	148,260	5.11
Cultivated	14,000	34,594	1.19
Open or grass lands	3,500	8,648	0.30
Commercial swamp	2,000	4,942	0.18
Noncommercial swamp	1,500	3,707	0.13
Lakes, lagoons, swamps, and flooded bottoms	50,000	123,550	4.25
Total	1,173,000	2,838,483	100.00

[a] 1 hectare=2.471 acres; 1 acre=0.4047 hectares.

GENERAL CHARACTER OF FORESTS.

Aside from their relative commercial importance, the forests of the province are of four distinct types: (1) Lowland and valley forests; (2) highland forests; (3) Molave-mancono type; and (4) fresh and salt water swamp forests.

Lowland forests.—This type is found from near sea level to a little over 100 meters elevation. The land is generally somewhat rolling and intersected by many rivers and creeks. In certain parts the surface is only a very few meters above the ordinary level of the Agusan River, so that great areas are flooded by the freshets of the rainy season.

The forests consist of an upper story of the crowns of large trees, some overmature, beneath which there is a thick cover of suppresed trees of commercial species mixed with some trees of the very soft kinds.

The interior has in most parts a ground cover of dense thickets of palms, pandans, rattans, and other vines, together with herbaceous plants, ferns, and small shrubs, and in the higher portions there is a considerable litter of fallen leaves and twigs.

On the banks of rivers and arroyos, a thick growth of bamboo is very common.

In the flat and low areas close to rivers, the tree growth is poor, being generally replaced by a dense jungle of vines. This is due to frequent flooding, which also accounts for the scarcity of litter.

The depth of the humus varies considerably, amounting to some 5 centimeters in some parts, while in others it is almost absent. Generally speaking, there is a light layer of humus everywhere except in the frequently flooded areas.

Though the composition of the forests of this type varies considerably in different situations, the following are found pretty generally throughout the type: Apitong, toog, udayan (oak), narra, anubing, bagtican, mayapis, panao lanipau (similar to dalinsi), taluto, and nato. Apitong, nato, and toog constitute about 50 per cent; narra about 10 per cent; and some 30 other species the remaining 40 per cent of the total stand. Toog and nato are evenly scattered through the level areas; narra grows in the lowest, wettest situations; and apitong on low ridges and on the level areas not subject to floods. Toog and apitong are the largest species, reaching 2 meters diameter and 20 meters clear length. Narra is very irregular in form, with numerous and large buttresses, the maximum recorded trunk diameter being 130 centimeters.

Others that reach over 1 meter in diameter are bagtican, mayapis, panao, lanipau, taluto, and binuang.

It is estimated that the lowland type constitutes 60 per cent of the commercial forest—that is, about 625,000 hectares (1,543,750 acres), with an average stand of 65 cubic meters per hectare (6,500 board feet per acre), or a total of 40,625,000 cubic meters (10,156,250,000 board feet).

Logging in this forest will present no difficulties and the greater part of the stand is mature, which makes it desirable to cut it to make room for the young growth. Great portions of the area, moreover, are of the highest grade of agricultural land, fitted for colonization, so that future forest growth may be dispensed with in the valleys and attention given to it only in those areas furthest from the rivers.

Highland forests.—These are found on ridges and ranges of hills which rise from the valley floor to heights of 30 to 200 meters, their sides being sometimes very steep, with frequent outcrops of rock.

Commercial tree species are abundant on the ridges, hollows, and level areas of these hills, but on the slopes the stand is less dense, sometimes very thin.

Generally speaking, the forest is easily accessible and contains large trees either in groups or scattered. On the ridges there are often found small pure stands of single species, but as a rule the forest is very mixed. Beside the same species as those found in the lowlands, there are found here also the following: Tanguile, and others resembling it, such as balakbakan, malagangau, saplid, and ubanan,[1] as well as a number of species furnishing yacal.

Apitong, mayapis, toog, and white lauan constitute about 60 per cent of the stand; tanguile and woods resembling it, 15 per cent; yacal, 5 per cent; and about 25 miscellaneous species the remaining 20 per cent.

Apitong, mayapis, and white lauan are found in scattered groups of two to eight trees. The first two are commonest on moderate slopes with deep moist soil. White lauan is rare below 80 meters elevation and develops best on moderate slopes and on the higher level areas. Toog is scattered through all parts except on steep slopes and the highest points. Yacal is found very scattered between 60 and 150 meters; it is commonest on narrow, rocky, and thin soiled ridges.

The largest trees are apitong and toog, which attain a diameter of 120 to 160 centimeters and a clear length of 25 meters, while mayapis, white lauan, and yacal rarely exceed 100 centimeters diameter and 15 meters clear length.

Balakbakan, saplid, and ubanan also sometimes exceed 120 centimeters in diameter.

The underbrush is not very dense. In a few fertile levels it resembles that of the lowlands, but contains a greater quantity of rattans.

The soil is completely covered with litter and small herbaceous plants, which, however, are scarcer on ridges and slopes and absent from the steepest parts. The quantity of humus naturally varies correspondingly in different situations.

The forest contains a good stand of sound, clean trees. Fallen trees are rapidly replaced by the new growth.

Except on slopes of more than 45°, the reproduction is excellent, especially of the dipterocarps. The most abundant seedlings are mayapis, white lauan, yacal, and balit (a kind of macaasim).

The greater part of this forest is on land unfit for agriculture and should be logged with a minimum diameter limit in order to perpetuate the forest.

[1] These are various local names of trees not yet specifically determined. It may be that some are merely synonyms of tanguile or tiaong. The wood specimens collected are all similar to these two.

The area of this type is estimated to be 15 per cent of the total area of commercial forests, or about 156,000 hectares (385,320 acres), with an average stand of 97 cubic meters per hectare (9,700 board feet per acre), or a total of 15,160,000 cubic meters (3,783,000,000 board feet).

Molave and mancono forests.—These are found in low mountains with dry, rocky soil.

The molave type extends along the coast from Punta Diuata to Puerto Nasipit. Fifty per cent of the stand is of first-group woods—molave, yacal, narra, and camagon. The remainder consists of second-group woods, 25 per cent; third-group, 5 per cent; and fourth-group, 20 per cent. The area of this type is about 9,500 hectares (23,465 acres), with an average stand of 68 cubic meters per hectare (6,800 board feet per acre), or a total of 646,000 cubic meters (136,500,000 board feet).

The mancono type is found on the ridges and broken slopes along the Cabadbaran and Tubay Valleys. The area is about 16,300 hectares (39,661 acres), with an average stand of 108 cubic meters per hectare (10,800 board feet per acre), or a total of 1,760,400 cubic meters (440,100,000 board feet), divided as follows: Lauan, 47 per cent; apitong, 13 per cent; mancono, 10 per cent; yacal, 8 per cent; tanguile, 6 per cent; miscellaneous, 16 per cent.

Fresh and salt water swamp forests.—Swamp forests, as well as areas subject to annual inundation, are common in the whole Agusan Valley. Their vegetation is similar to that of the lowland forests, but timber trees are few and small. The undergrowth consists of vines, pandans, scattered shrubs, and herbaceous plants.

The mangrove or salt water swamp forests which occupy the delta of the Agusan will furnish little saw timber, but great quantities of ties, piles, and firewood. Also, they contain great areas of lumbia palm (*Metroxylon rumphii* Mart.) which could supply alcohol, sago, and leaves for thatching.

The area of the mangrove forests is about 4,400 hectares (10,868 acres), of which 20 per cent, or 880 hectares (2,174 acres) contains palms or scrub, and 80 per cent, or 3,520 hectares (8,694 acres), contains a stand of trees amounting to 81 cubic meters per hectare (8,100 board feet per acre), or a total of 285,120 cubic meters (71,250,000 board feet).

UTILIZATION OF FOREST PRODUCTS.

In the northwestern part of the province there have been cut considerable quantities of molave, guijo, and yacal logs for the Manila and Cebu markets. Otherwise, logging on a commercial

scale is unknown in the whole province. Small quantities of timber are extracted annually for local supply and for public works. The most profitable business has been that of getting out table tops of narra buttresses. Rattans, firewood, resins, gutta-percha, and tan and dye barks have been exploited to some extent in recent years.

LUMBERING.

The forests of Agusan in general present good opportunities for lumbering on a large scale. The greater bulk of the timber is of apitong, various lauans (including tanguile), and toog, while in certain limited regions guijo, mancono, molave, narra, and yacal are abundant. The tables on pages 53 and 54 show the distribution of the different species.

LABOR.

The labor problem will have to be solved by importing men from Cebu, Bohol, and Leyte and inducing them, with their families, to take up homesteads on the cleared areas. Moreover, the Manobos will furnish a considerable number of fellers, experience showing that with fair treatment they make apt and docile workmen.

The imported laborers, it is estimated, can be gotten for $12.50 to $15 per month and the Manobos for $7.50 to $10 per month.

LOGGING ROADS.

The extent to which roads or railroads are to be built will naturally depend on the magnitude of milling operations.

About ten different lines are indicated along which logging railroads could be cheaply constructed, with no other difficulties to overcome than the frequent small arroyos which have to be crossed and the occasional weakening of the roadbed by the annual floods. Such lines, ranging from 5 to 20 kilometers (2 to 8 miles), would serve as feeders to carry logs to the nearest points along the rivers, whence the logs could be rafted to the mill, unless the latter were to be established inland at some point of convergence of the roads. One line tapping a very large area and leading directly to the coast is the Vitus-Libertad-Puerto Nasipit line, about 25 kilometers (15.6 miles) in length.

Logs can also be snaked in from either bank of any of the tributaries of the Agusan River over distances of from 1½ to 3 kilometers (1 to 2 miles). Many of these tributaries are large enough for rafting. The donkey engines can be taken up the rivers on broad, shallow rafts or scows and can even be operated from these in places where they cannot easily be landed. If

rafting by the current is not rapid enough, a launch of not over 5-foot draft could be used during the entire year to tow the rafts.

SAWMILLS.

Portable mills could be established at the points of beginning of the various railway lines and in the Quijauan Valley, about 6 kilometers (4 miles) east of Puerto Nasipit, but for a large mill and yards the best site is between San Vicente and Vitus, to which point logs could be hauled and rafted from the various cutting areas in the Agusan Valley.

MARKETS AND TRANSPORTATION.

Lumber and logs for Philippine markets outside the province have to be shipped by sea. Ships not exceeding 10-foot draft can easily pass the bar and reach San Vicente. Export lumber has to be shipped in vessels of 18-foot draft or more. Such vessels cannot enter the river without dredging the bar and certain sand banks further up the river.

The cost and maintenance of this dredged channel would be no less, and the loading of the ships less safe, than if a railroad were built on the proposed line Vitus–Libertad–Puerto Nasipit, in which port ships of 25-foot draft can be loaded. This road would at the same time serve to carry to the mill logs from the molave-yacal areas.

Unless either the channel is dredged out or the railroad built, export lumber will have to be loaded on barges and towed to the harbor at the mouth of the river, about 15 kilometers (9 miles) from the mill, but this can be done only from November to June, as during the southwest monsoon Butuan Bay is so rough as to make transshipping difficult or impossible.

OLONGAPO NAVAL RESERVATION.

In pursuance of its policy to take all practical steps to encourage the use of Philippine woods instead of lumber imported from abroad, the Bureau of Forestry conducted a short reconnaissance of the Olongapo Naval Reservation. The work was taken up at the request of the naval authorities who wished to ascertain whether it would be practicable to install a mill and logging equipment to utilize some of the timber with which the slopes of the reserve are heavily covered. The reserve is situated in the Province of Zambales and covers approximately 65 square miles, of which about 45 square miles contain commercial forests. The timber on at least 20 square miles is so situated as to be accessible by modern logging methods. The average stand is estimated at 145 cubic meters per hectare or about 14,500 board

feet per acre. The report which was prepared after the completion of the reconnaissance contains such definite recommendations concerning equipment and location as are necessary to provide for a sawmill to cut from 10,000 to 15,000 board feet per day. It is not anticipated that so large a quantity would be needed locally in the navy yard, but it may prove practicable to store the excess of lumber until it has seasoned and then ship it for the use of the various navy yards, to the United States. If the United States Navy should decide to exploit the timber on this reservation and to make extensive use of Philippine lumber, such a decision will have a very desirable effect in calling the attention of private shipbuilding concerns and of wood users in general to the superiority of Philippine lumber over many kinds which are now being used.

WORK CONTEMPLATED DURING THE COMING YEAR.

It is the intention of the Bureau to send during the coming year a large reconnaissance party to the Island of Samar. At present there are only very inaccurate data on file in reference to the forest resources of this island, but everything indicates that the large forests contain much valuable timber and that in several parts thereof areas can be located which will be suitable for concessions to be operated on a large scale.

COÖPERATION.

The Bureau took an active part in the annual fairs at Iloilo, Capiz, and Surigao, and at all these places instructive exhibits were made with material secured partly by the forest officers and partly donated by licensees and other people interested in public forests. In each of these expositions short lectures were also given by forest officers explaining the importance of our forests and the work and aims of the Bureau. The Bureau received prizes in all three fairs.

The Bureau coöperated in the extermination of locusts by issuing instructions to all forest officers to report to the proper authorities whenever in the course of their official trips swarms of locusts were discovered.

Forest officers also coöperated with the Welfare Committee not only in observing strictly the yearly clean-up week in each forest station, but also by explaining its necessity and importance to the inhabitants of the small barrios through which they passed on their inspection trips.

As stated in other parts of this report, the work of the Bureau in Baguio is carried on in coöperation with the city of Baguio and the Bureau of Public Works.

With the Bureau of Education, coöperation has been continued in supervising school nurseries and in supplying a large quantity of tree seeds.

Seeds of trees which might prove of value to the people of the Mountain Province, such as pili, almaciga, mango, etc., were also secured by the Bureau and tried in the Baguio nursery.

Extensive coöperation was carried on with the Bureau of Science, by supplying it with botanical collections not only of forest trees, but also of other plants which appear to be of special interest, the Bureau of Science in turn supplying the forest stations with mounted sets of the botanical specimens collected in their jurisdiction.

Finally, the Bureau of Constabulary coöperated with the Bureau of Forestry in the suppression of illegal caiñgin making.

THE WORK IN BAGUIO.

That part of the Pakdal Valley in which the forest nursery is situated has been included in the Baguio Forest Reservation by Commission Resolution No. 119, dated October 12, 1915. This resolution also authorizes the Director of Forestry to settle any claims which people might have on improvements existing on the land. Consequently, ₱500 was paid to an Igorrote who had made several rice terraces on the government land now being used for the nursery.

The object of the Baguio nursery is to raise and distribute such trees and other plants as have already proved their adaptability in this vicinity, where the soil is poor and where the plants are subjected to the extremes of the dry and rainy seasons. Experiments are also made in the raising of useful and ornamental trees adapted to reforestation throughout the Mountain Province. All plants grown in the forest nursery and ready to be transplanted are either transferred to the roads and public lands or given free of charge to residents of Baguio for the beautification of their homes. Never before have so many plants been raised and distributed as in the fiscal year 1915, 10,800 plants having been given to the city of Baguio, to the military authorities at Camp John Hay, and to private individuals. The commercial value of these plants is estimated to be at least ₱4,200, while the total cost of the work at the nursery, including supervision and labor, has been only ₱3,800. The policy of the Bureau of Forestry to make no charge for plants given to private individuals has proven a success, as the many plants which have been distributed free of charge not only beautify the individual homes, but tend to increase the beauty of the entire townsite of Baguio.

Special attention has been paid during the past year to the propagation of trees and shrubs native to the Mountain Province. Of the 400 different species experimented with, only about 200 gave satisfactory results and more than one-half of these are of the Mountain Province. The nurseryman in charge made several trips in the vicinity of Baguio for the purpose of collecting seeds and herbarium specimens. One of these trips was extended as far as Mount Polis, between Bontoc and Banaue, and much valuable material was secured. The nursery herbarium now contains 316 specimens, about 90 per cent of which have been collected in the Mountain Province.

A small experiment in reforestation has been carried out on bare hills near Pakdal. Trees of ten different species were set out and most of these are now in a very promising stage. Trials were also made with a considerable number of the more common shade and ornamental trees and shrubs of the temperate Zones which were obtained from the United States and Germany. From these experiments, the following conclusions can be drawn:

Fir and spruce trees (tried in dozens of varieties) and most pines will absolutely not grow in these regions, while curiously enough, various species of juniperus and cupressus and thuja grew not only very well from seeds, but seem also to grow readily from cuttings; linden elm, and birch trees, when they did germinate at all, stayed hopelessly dwarfed; ash, alder, locust, sycamore, paulownia, liriodendron, catalpa, ailanthus, liquidambar, etc., did a little better and would justify another year or two of cultivation for the purpose of observation; the same is the case with a number of the beautiful flowering shrubs of the Temperate Zones, such as syringa, philadelphus, deutzia, spiraea, exochorda, calycanthus, rhus cotinus, lonicera, berberis, etc. Very gratifying results were obtained with trees from Formosa; alnus maritima from that island shows a really remarkable growth; camphor, sapindus, and cryptomeria also grow well here.

Certain subtropical shrubs, such as rhododendron, azalea, myrtus, punica granatum, erica herbacea, etc., show so far a very satisfactory growth. Another year should show whether they will bloom satisfactorily enough to recommend their further cultivation; so far they have not flowered.

Experiments with sappy cuttings of camphor trees revealed the interesting and perhaps valuable fact that they rooted very readily in a short time and made good plants.

As during previous years, quite a number of seedlings were considerably damaged or even killed during the excessive rains of the wet season, experiments have been made with a new

kind of seed beds. These seeds beds contain a stone drainage underneath which allows the superfluous water to drain off readily. It is expected that good results will so be obtained. As such seed beds are of course considerably more expensive than the ordinary ones, only a limited number of them can be constructed.

Experiments have been started with the raising of economic trees of special value to the inhabitants of the Mountain Province, such as pili, almaciga, citrus, etc. For this purpose, some up-to-date glass-covered cold frames have been constructed and will be used as soon as the necessary seeds have been obtained.

During the coming year the same work will be continued and special attention will be paid to the planting of trees along the roads and to the upkeep of plantations which have already been made. In addition, the general nursery work will be continued so as to have always a sufficient supply of plants on hand.

THE FORESTRY EXHIBIT AT THE PANAMA PACIFIC EXPOSITION.

The Bureau of Forestry exhibit at San Francisco was a success in every respect. It attracted at least as much attention on the part of the general public as any other Philippine exhibit.

The exhibit took the grand prize for the general exhibit in forestry and forestry products and in installation over all the countries exhibiting. The jury awarding the highest honor within their power was composed of men from the four quarters of the world. This honor is due not only to the work of the Bureau, but to the splendid coöperation of the lumbermen and dealers in minor forest products, both Filipino and American.

The following is an approximate list of the prizes awarded to the Bureau of Forestry and its coöperators, who contributed toward the exhibit:

Grand prizes	3
Medals of honor	4
Gold medals	7
Silver medals	7
Bronze medals	6
Honorable mention	2

The Philippine forestry exhibit was in the Agricultural Palace and covered 10,200 square feet of floor space. It was the Mecca for visiting lumbermen, architects, and other persons interested in lumber and various minor products. From a practical point of view, this last was the most important fact, for the chief object of installing the exhibit was to make it a living advertisement of the forest resources of the Philippines.

Forest product users throughout the United States were given samples of various products useful in their line for experimentation and numerous firms are now conducting tests which, if satisfactory, will lead to the purchase of the crude materials direct from the Philippines instead of getting them through London, Hamburg, or New York. The following are some of the products now being tested out: Woods for tool handles and special electrical and scientific apparatus, which will give an outlet for woods in small quantities, but at high prices; almaciga for varnishes; tan barks for tanning extract; caña bojo and other pulp material for high-grade paper; wood oils and resins for medicinal and other uses; Philippine rattans; and many others. Even products which have only a local use, but were used in the exhibit for structural and ornamental purposes, such as sawale and midribs of palm leaves used for native brooms, interested certain manufacturers and the possibilities are being looked into for importation into the United States.

Owing to the war, many American manufacturers who were obtaining their crude materials from the tropical countries of South America, Africa, and Asia have been cut off from their supply and are on the lookout for new sources; many of these manufacturers have become acquainted with our resources and are now investigating the supply in the Islands.

Several manufacturers stated to the forester in charge of the exhibit that some of the woods shown in the exhibit were bought by them in European markets under some African or South American name for a high price and an import duty paid in the United States, making the price from two to four times higher than if bought direct. This was also the case with Philippine rattans, varnish gums, and gutta-percha, which were bought in Singapore or Europe.

The exhibit acquainted tens of thousands of people with the beautiful woods of the Philippines and corrected the erroneous idea of their nonavailability, so the germ has been sown in the ultimate users' minds and there is no doubt but that when they are building houses or buying furniture the question will be asked if Philippine woods cannot be used, and the middlemen and dealers will be forced to carry stocks of Philippine woods to satisfy the demands of the public.

No actual count was kept of the number of visitors daily, as this was practically impossible; but on certain days a count was made; on July 4, 1915, 6,200 people were counted who stopped inside the exhibit. It was estimated that the daily average number of persons visiting the forest exhibit was between 500 and 600. This gives a total of about 150,000 people who visited the

forestry exhibit throughout the exposition; deducting one-third of this total as "repeaters" gives about 100,000 people who acquainted themselves with Philippine forestry products and many of these will undoubtedly create a demand for Philippine forest products in the future.

To cite an example: A woman visited the exhibit and asked several questions; she later sent her architect to see the man in charge and this resulted in his specifying the interior trim of this woman's house in Philippine woods, the contract for which amounted to about ₱38,000. This wood was bought from a San Francisco dealer in Philippine woods.

Talks and addresses were given by the forester in charge to contractors, architects, and lumber associations and to conventions held during the exposition; and even while on leave the forester gave talks to various commercial clubs and organizations from San Francisco to New York, acquainting them with the possibilities of obtaining lumber and other products from the Philippines.

That the exhibit gave a considerable impetus to the trade in Philippine lumber along the Pacific coast was frequently stated by visiting lumbermen and manufacturers and even before the close of the exposition inquiries were received by Philippine firms from persons whose attention had been drawn to Philippine woods and minor products. On account of the difficulty in obtaining transportation, the present exorbitant freight charges, and the general depression caused by the European war, the practical results will undoubtedly be deferred until commercial conditions right themselves; but the information the American public obtained from the exhibit will not be forgotten and will bear fruit in years to come in increased commercial relations with the Philippine Islands.

The Bureau has been congratulated on all sides for the wonderful showing made at the exposition and for the very competent and efficient management of the exhibit. Much credit is due, for the installation and for the active maintenance of the exhibit during the whole exposition, to all the forest officers, both Americans and Filipinos, who were detailed to the exposition.

The following very condensed outline shows the great variety of different articles included in the exhibit.

SITUATION.

The exhibit occupied a long irregular zigzag strip, about 10 meters wide in its narrowest part, extending for about 100 meters along the southwest corner of the Palace of Agriculture.

It was surrounded and divided into sections of varying size and shape by colonnades of polished tarau palm columns surmounted by a deep frieze and cornice of windowshell and Philippine woods.

Section I (about 100 square meters) contained exhibits of rubber, gutta-percha, almaciga, solid and liquid dipterocarp resins, pili resin, pili nuts and oil, beeswax, cinnamon, etc.

Section II (same area) was completely occupied by raw and manufactured rattans, except for two platforms occupied, respectively, by rattan workers and musical-instrument makers.

The background of Sections I and II was formed by four large transparencies showing forest and logging scenes, surrounded by a varied collection of manufactured minor products.

Section II (same area) was devoted to manufactured mill products, such as doors, veneers, panelling, and flooring. Here was also a carpenter's bench with tools, for demonstration purposes, repairs, preparation of special specimens for inquirers, etc.

Section IV (about 25 square meters) was the office of the exhibit.

Section V (about 200 square meters) contained a long rack on which were installed collections of seeds and fruit of 200 species, and a miscellany of small manufactured articles. Beside this there were table tops, small pieces of furniture, and wooden vehicle parts.

Section VI (about 250 square meters) was almost completely filled with furniture, chiefly of Philippine origin. Here were shown also the forest maps and, in a small kiosk, copies of all bulletins and other literature of the Bureau. In this section was also a stand containing some hundreds of photographs of forest scenes, trees, etc.

Section VII (same area) was also occupied chiefly by furniture, but principally manufactured in the States from Philippine woods. At the end of the section (and of the exhibit) was a large rack containing finished and unfinished single-piece table tops.

The background of Sections III to VII, except inside the office, was formed by an unbroken series of planks, about 300 in number and representing over 130 species. Below the planks were arranged about 100 framed botanical sheets and 130 logs, both of genera and species corresponding to the planks.

Beginning with the office and extending to the end, all the floors were covered with flooring of apitong, yacal, almon, and lumbayao, donated by various manufacturers and dealers.

THE LUMBER INDUSTRY.

The total amount of lumber cut under license in the public forests during 1915 was 276,267 cubic meters, as compared with 294,688 cubic meters for 1914. In addition, there was a very large but undetermined amount cut without license for personal or domestic use. As anticipated in the annual report for 1914, the year just passed has experienced a serious depression in the lumber market, due primarily to conditions brought about by the European war, the principal cause affecting the trade, as in most other industries, being the very great shortage of transportation facilities to carry exports. The lumber industry has suffered specially from this cause, leaving, as the result of the inability of the lumbering companies to export their stock, a market flooded with lumber and (the most serious feature of the situation) facing but a poor outlook for remedying the condition. While freight rates are still going higher, transportation facilities are becoming scarcer. Orders for export are on hand, but it is impossible to fill them. None of the mills are working with the activity or optimism of a year or more ago. On the contrary, with no appreciable local demands for lumber the companies have been forced to various expedients, such as shutting down temporarily, curtailing their output to the minimum to keep employed at least the most desirable portion of their force, or chartering vessels at almost prohibitive rates. Most unfortunate from an economic standpoint is the discontinuance of operations, as labor is thrown out of employment and general depressing conditions ensue. In some cases, however, the mills were absolutely forced to shut down as they could no longer dispose of their products. Operations were maintained up to the last minute in the hope that a remedy could be effected and in certain cases work was still being continued even with the yards full of stock which was gradually depreciating in value while subjected to the elements.

The situation of the lumber industry at this time suggests the question as to what can be done, insofar as the Government is concerned, in assisting the companies to bridge over the crisis. Two remedial measures suggest themselves: (1) That governmental assistance be extended in obtaining shipping facilities and (2) that the Government encourage the use of, and insofar as may be consistent with an economical policy, purchase a large amount of lumber. This seems a very opportune time for the Insular Government to requisition a large supply of lumber, with the added advantage of having later on a sufficient amount of seasoned material with which to fill requisitions. So closely allied to the present and future economic condition in

the Philippines is the prevailing status of the lumbering industry that it is thought that any governmental assistance that can now be taken in the interest of relieving the present stagnation will be more than justified in the years to come. Government assistance and protection of the industry at this time will help a great deal toward the progress of the industry later on.

As referred to in the previous report, the military authorities had contracted for nearly 2,500,000 board feet of lumber to be delivered during the year covered by this report. This order, so far as known, was completely filled by the lumbermen, and it is strongly to be hoped that the lumber supplied to the Army may have been so satisfactory, both in the time of delivery and in quality, that the authorities will continue to buy local lumber instead of importing it as heretofore. In thus contributing to having Philippine woods replace the imported woods formerly used, the military authorities are performing for the lumbermen a service emphasized by present conditions and appreciated by the companies.

The question often arises as to the fitness of native woods as substitutes for imported woods. This very question has the tendency of adding to the depression of the market. No justifiable reason exists for the claim of superiority of imported woods, as the native products which can be supplied are as good and very often better than imported woods for the purposes for which they are to be used. There is no reason for the importation of woods into this country and the Government should be foremost in using and in encouraging the use of nothing but native woods. Coöperation on the part of the Government and the lumbermen would bring about an adjustment of the problem of substitution in a way that will be most beneficial to the interests of the Islands.

A very important step which will eventually react to the mutual advantage of the lumbermen was the formation during the latter part of the year of the Philippine Lumber Manufacturers' Association. Up to very recent times there existed no coöperation among the individual companies in this industry, but the formation of this association will, it is to be hoped, place the industry on a more solid basis and will tend not only to secure for the members the recognition of which the importance of the industry is so deserving, but will be a means of combining the interests of the industry as a whole. Similar organizations have accomplished important results for lumber companies in the United States, and it is to be expected that directing the united efforts of the members of the organization here toward the common interests of all will mean faster progress than in

the past, when each individual attempted alone to bring about certain remedies. Meeting one another and working out their interests together will help a great deal to bring the market back to its normal state when the opportunity once offers itself. Practically all the mill owners of the Islands are members and the association as an expression of good will elected as honorary members the Director of Forestry and the chief, division of forest management. It is a great satisfaction to report the formation of this organization and it is sincerely to be hoped that it will take advantage of the many opportunities with which it is at present confronted.

A very encouraging step was taken by the association during the year to relieve the industry of a great and long standing disadvantage. As mentioned in the previous annual report, on account of the complete lack of grading rules under which all Philippine export lumber could be inspected and graded, a great deal of undesirable lumber was being shipped to foreign markets and there oftentimes rejected. Grading rules are absolutely essential before a reliable export market can be established. In competition with other woods bought and sold on the foreign markets under grading rules drawn up in a way best suited to the purposes to which they are to be put, it is absolutely necessary that Philippine lumber be offered to the world's markets under similar conditions—that is, accompanied by a certificate of inspection, stating that the shipment is of a certain grade or grades; and that such certificates may have any value, it is necessary to have a recognized body behind them. Only through the proper grading and certification of export lumber can Philippine woods ever hope to gain their proper place in foreign markets. This is one great opportunity for the association to perform a permanent service for its members. It is sincerely to be hoped that the association will adopt a new set of rules of such a nature that they will have the immediate support of the Government, as the voluntary adoption of such rules will be of much more advantage to the industry than would ever be obtained from the Government forcing a set of rules on the market and compelling all shipments to be inspected under them. When the association rules are once completed and proven acceptable, the Government should be the first to adopt them and thus lend its moral support. This matter will be taken up by this office as soon as the rules are once completed and ready for use.

As a practical means of exhibiting its support to this movement, the Bureau secured the authorization in the last Legislature to appoint two lumber inspectors, who, at the instances

of the lumbermen, will perform any inspection work which may be requested and whose services will be used in all such exigencies of the Government. The United States Forest Service has already been requested to lend its assistance toward securing suitable appointees for the position of lumber inspector. These appointees should be picked men and should be thoroughly familiar with the entire hardwood situation and market in the United States. This familiarity should not be theoretical, but based upon sound knowledge gained through experience. They should also be familiar with the markets of foreign countries and should have a thorough working knowledge of the hardwood lumber industry, particularly insofar as refers to the manufacture of the raw product. Thus, it will be seen that one of the objects of this plan is to lessen the heavy losses incurred by Philippine lumber exporters and will confer the additional advantage of assuring the purchaser of Philippine lumber that an order placed by him in the Philippines will be filled scrupulously and satisfactorily, in accordance with the specifications of the contracts which have been accepted mutually by the purchaser and the exporter. In instances where private work is performed, the salaries and expenses of the inspectors will be borne by the individual or company using them. In this way it costs the Government nothing and a great deal is being accomplished for the country through the exportation of properly inspected and certified lumber. As this becomes recognized and buyers realize that they can be sure of getting what lumber they order, just so soon will the export trade increase until there is a prosperous market for Philippine lumber. These inspections will, of course, be carried out in direct coöperation with the lumbermen's association.

While the question of grading is a very important measure that will have the constant support and assistance of the Bureau, the employment of two lumber inspectors may be regarded merely as a temporary expedient, which will not be permanently necessary. There is every reason to believe that as the present situation is remedied and the industry resumes its former financial stability, the association will employ inspectors on its own account, as do the various associations in the United States. When this is brought about, Government inspectors will no longer be needed. Additional aid will be given by the Bureau in training for this inspection work a corps of Filipinos, who will be able to enter the employ of the association, should such a course become desirable.

A number of complaints were heard during the latter part of the year of the very serious effect of the new law (measure-

ment of timber in the round before manufacture) on the lumber industry and how this law has had a tendency of greatly increasing forest charges and consequently causing a depressing effect upon the lumber market. The seriousness of the situation is not anywhere near as much as claimed, but it has been accentuated by the fact that the law went into effect during a depression of the lumber market and at a time when the Bureau of Internal Revenue made an increase of taxes on all kinds of business. Actually, the new timber-scaling law has increased forest charges only from 25 per cent to 50 per cent, i. e., whereas the charge on fourth-group timber was ₱1.36 per M under the old method, it runs from ₱1.70 to ₱2.04 per M under the new law. It is easily seen that an increase of from ₱0.34 to ₱0.68 per M on lumber selling around ₱60 per M can hardly have the depressing effect attributed to it. There is no doubt but what the situation will adjust itself when once the lumbermen realize that they must manufacture much more economically under the new system than they did under the old one, which, owing to its very character, invited indiscriminate waste on the part of the mill force. It would obviously not be good business policy for the owner of any property to allow a prospective buyer to pick out only the desirable portion of that property and then disregard or reject the less desirable part, the owner having no voice in the matter.

A comparison of the exports and imports of timber and lumber for the years 1914 and 1915 is shown in the following table:

EXPORTS.

	1914	1915
Timber	₱61,744.00	₱19,267.00
Lumber	619,528.00	470,551.00
Furniture and others	71,982.00	108,603.00
Total	753,254.00	598,421.00

IMPORTS.

Ties	₱5,424.00	
Timber	122,006.00	₱85,578.00
Lumber	965,476.00	247,552.00
Furniture and others	449,812.00	339,295.00
Total	1,543,678.00	672,425.00

Subsequent information proves these figures to be incorrect

A study of the above table shows a total value of 20 per cent decrease in the exports. This is probably entirely explained by the fact that during the entire year of 1915 it has been very difficult and sometimes impossible to obtain transportation for the export material. Studying the table of imports, it will be

Subsequent information proves these figures to be incorrect

noticed that the total value has decreased by the large amount of 57 per cent. One might at first think that wood is being used less, but the real explanation is that a great deal more native wood is being used. An instance is the item of ties, which has gradually decreased from a high value some years ago to nothing at all at the present time. So it is to be expected that in time, excepting specialties not manufactured in the Philippines, all items of timber and its manufactures will disappear almost entirely from the import list.

Subsequent information may prove these figures to be incorrect.

THE CHINA MARKET.

A great deal of propaganda work has been carried on during the past year with a view to encouraging the exportation of lumber to China. Numerous inquiries from interested parties in China have been answered by supplying data regarding the character and available supply of Philippine woods, in some cases considerable numbers of copies of extracts being furnished to applicants; articles have been published in journals having a wide circulation, and sets of specimen panels furnished to Government officials and to lumber dealers. The following extracts from letters and publications will serve to illustrate the character of this propaganda:

[No. 1.]

PHILIPPINE WOODS IN THE CHINA MARKET.

Even before the Spanish conquest of the Philippines, there was some traffic in wood between the Islands and China, but this was probably limited to very small quantities of some of the most valuable cabinet woods, such as ebony and camagon, narra, or tindalo, and perhaps also some of the very strong and durable woods used in shipbuilding. During the long Spanish régime this traffic increased considerably, especially as regards the latter class of woods. Among the species oftenest mentioned as being exported to China were aranga, ipil, molave, dungon, and yacal. These exports ceased almost entirely at the outbreak, in 1896, of the revolution against the Spanish power and it was only some years after the establishment of the American Government in these Islands that they began again.

At first, the exports of wood to China were of the same character as during the latter part of the past century—that is, they consisted mainly of those shipbuilding timbers known since ancient times for their strength and durability, with a smaller proportion of cabinet woods. But, meanwhile, two great changes had taken place. Even before the revolution, most of the very high-grade construction timbers had been becoming scarcer and higher priced. After peace was established under the present Government, the local demand for these woods naturally increased, not only to repair the damages caused by neglect and active destruction during the war, but also for many new undertakings. On the other hand, there began about ten years ago the exploitation on a large scale of the great dipterocarp forests, with the result that there has become available a

supply of the very abundant woods of the apitong and lauan groups greater than was ever before found in the markets. Practically the only wood whose status has not changed much is yacal. This, as well as the other high-grade construction timbers, had been growing scarcer, but the opening of new forests, while contributing very little to the supply of molave, ipil, or dungon, did increase very much the supply of yacal, so that the latter is now available in as great quantities and perhaps even greater, than during the latter years of the past century.

The result of these changes is that the supply of the very high-grade woods, except yacal, will always be limited, while there will be available for export great quantities of apitong and lauans, of yacal, and of a few other woods, pagatpat and lumbayao being the most notable among those that do not belong to the dipterocarp or lauan family.

A comparison between these Philippine export timbers and the other foreign woods now used in China is perhaps best introduced by showing the mechanical properties of Philippine woods and those of some of the best-known American and Bornean timbers. The following figures are taken from "Mechanical Tests, Properties, and Uses of Thirty-four Philippine Woods" by Rolland Gardner, Bull. No. 4, Bureau of Forestry, Manila, 1907:

Name of wood.	Country of origin.	Average modulus of rupture (pounds per square inch).	Average modulus of elasticity (1,000 pounds per square inch).	Average specific gravity of dry wood.
Oregon pine	United States	7,900	1,680	0.510
Longleaf pine	do	10,900	1,890	.610
California redwood	do	9,110	1,320	.445
Borneo yacal	Borneo	12,395	2,027	.755
Kruen (apitong)	do	8,700	1,604	.653
Seraiah mira (red lauan)	do	7,450	1,299	.614
Seraiah puteh (white lauan)	do	9,390	1,554	.547
Yacal	Philippine Islands	15,690	2,583	.843
Guijo	do	15,150	2,158	.708
Apitong	do	11,620	2,144	.645
White lauan	do	9,760	1,653	.446
Red lauan[a]	do	7,100	1,201	.405

[a] The tests of red lauan were made only on beams with a very high average moisture content (65 to 84 per cent); for seasoned lumber, the figures would be considerably higher, probably approaching those for white lauan.

[No. 2.]

Taking the Philippine woods of importance for export as a whole, we can consider them as falling into four main classes—the yacals, the apitongs, the lauans, and the woods belonging to the Leguminosae or so-called "locust" family of the Temporate Zone.

YACALS.

This group comprises trees locally known as yacal, narig, mangachapuy, and dalingdingan. The timbers are hard and durable and are much more plentiful than the other very durable commercial woods of the Islands.

APITONGS.

The apitong group comprises timbers known as apitong, panao, hagachac, and guijo. The first three are marketed under the name of apitong. Guijo is generally considered somewhat superior. Well-seasoned timbers of this group weigh between 40 and 60 pounds per cubic foot.

LAUANS.

It is in this group that the main wealth of the Philippine forests lies. It comprises timbers locally known as white lauan, red lauan, almon, bagtican, mayapis, tiaong, and tanguile. For the sake of simplicity, they may be divided into two classes, namely, the white and red lauans. Export grades of the red lauans are used in Europe and America as substitutes for mahogany, and are frequently sold as such. While not so hard and durable as mahogany, lauan has a beautiful grain and permits of a very fine polish.

The main bulk of the forest produces timbers of comparatively few kinds and in some instances approaches pure stands of one or two grades. It is estimated on an average that 70 to 80 per cent of all the dipterocarp forests will yield timbers that belong to the groups described above.

LEGUMINOSAE.

Next in importance to the dipterocarp family are the leguminosae, or locust family, to which a number of the commercially important cabinet woods of the Philippines belong. Among the principal representatives of this family are narra, tindalo, ipil, supa, acle, and banuyo. No finer hardwoods are found anywhere in the world.

STAND.

The average stand in the virgin forests of the Philippines may be roughly estimated to run 6,000 board feet per acre and over. On some of the tracts now being worked under long-term license agreements (or concessions as they are popularly called) the stands run between 15,000 and 35,000 board feet per acre. Stands of 45,000 to 60,000 board feet per acre are not infrequent, principally at elevations between 800 and 1,200 feet above sea level.

Export timbers fall roughly into four principal classes: Woods for interior finish and furniture, cabinet woods, woods for special uses, and heavy construction timbers.

INTERIOR FINISH AND FURNITURE WOODS.

The prime requisite of a wood for these purposes is that it be at least fairly abundant. Also, it must be not very difficult to work and to finish, of good size, and last, but not least, of pleasing texture and color. All of these requisites are fulfilled by the woods of the dipterocarp (lauan) family. This family occupies the place that the conifers do in the north Temperate Zone, but possesses a wider range of color, hardness, and other qualities. The lauan group of dipterocarps contains the greatest amount of timber especially fitted for interior finish and furniture. Tanguile, red lauan, and white lauan are obtainable in great quantities, have a fine ribbon grain when quarter-sawn, and in texture and color the first two resemble true mahogany and its substitutes very closely. White lauan differs from them only in color, being white with a very pale grayish-brown tint. It is pretty in natural finish where a light color is desired and, on the other hand, lends itself very well to staining. Almon, a very pale red lauan, is similar to white lauan as regards stains.

The other woods of the same family—guijo, apitong, and yacal—are also abundant. This fact and their greater hardness enable them to fill

a demand for flooring in place of oak, red beech, maple and other American woods which are yearly becoming scarcer. Guijo is light ashy brown to reddish brown and apitong is somewhat darker. Finished with wax or varnish, they range from reddish brown to dark chocolate. Both are hard and of rather fine texture. Where a very hard wood is desired for flooring, yacal, the hardest and heaviest of the dipterocarps and the most abundant of the hard, heavy, and durable woods in the Philippines, will find a place.

There are several woods of other families which, though not as abundant as the lauans, are still to be obtained in sufficient quantities to supply industries that do not require many millions of feet per year. Such are lumbayao, pagatpat, and nato. Lumbayao is similar to red lauan in appearance, but is slightly harder and tougher and has a more conspicuous flake grain when quarter-sawn; nato is of similar color and texture, but of very homogeneous grain; pagatpat also is even-grained, but of a rich dark-brown color.

In the Philippines many other hard, durable, beautifully colored woods are also frequently used for flooring and interior finish; for the export trade, however, these woods, on account of their beauty, comparative scarcity, and higher price, should rather be classified as cabinet woods.

[No. 3.]

The panels of Philippine woods which you sent me are certainly the most satisfactory advertisement I have yet seen for the introduction of these woods into China. So much so, in fact, that I am going to ask you as a favor to let me know what it would cost to make up a variety of 50 samples each of almon, apitong, lumbayao, tanguile, and white and red lauan; and 25 samples each of guijo, pagatpat, and yacal.

The panels referred to in the above-quoted letter were specimens 12 by 18 inches, of ten of the most abundant species, polished on one side and each accompanied by a descriptive label containing such data as mechanical properties, durability, sizes and supply, and prices. A translation of the labels into Chinese was made by the Mindanao Lumber Company and attached together with the English label. Similar sets have been sent also to the Forest School of the University of Nanking and to the American legation in Peking and requests have been received for further sets, which will be prepared in the near future.

PERSONNEL.

In the small American personnel of the Bureau very important changes were necessitated throughout the year. As has often happened in the higher technical positions in the Bureau, as the American forester becomes more experienced and more valuable in the technical forest work of the Islands, he is apt to secure a more lucrative position elsewhere, unless the Bureau is able to give him fitting advancement. The failure of the Bureau to give promotions in the case of two American foresters during the year resulted in their accepting more remunerative

offers from Sumatra and Borneo. One of these vacancies, as well as two other similar vacancies existing at the time the previous report was submitted, were filled by three appointments from the United States. With the organization of the new division of forest management in the Bureau, having under its charge the supervision of the large lumbering operations in the Islands, and anticipating a more efficient administration of lumber mills coincident with the operations of the new scaling law which become effective in July, there were appointed two so-called field assistants selected from men in the United States Forest Service who have passed the ranger civil service examination, but have not necessarily qualified in the technical examination for forest assistants. The employment of these men has not only resulted in a decided increase in efficiency along these lines, but as a sound investment to the Philippine Government. Two American clerks resigned during the year, one holding the position of stenographer to the Director and the other, the license clerk, who had been with the Bureau for a number of years and a major portion of whose duties, as discussed under the subject "clerical work," will, in the interest of Filipinization, be absorbed by Filipino employees. Despite the fact that the Bureau during the year had a very welcome acquisition in the appointment of 19 graduates of the Forest School, 10 rangers, almost all graduates of the school, resigned during the year, principally because they were able to better their status either in forestry or outside work. This emphasizes the oft-repeated argument that, if the Government is to receive adequate return on its investment in the education of these men who, as years go by, will become more valuable in the administration of the forest resources, a definite scale of salaries more commensurate with other departments of the Insular Government will have to be accorded this class of employees. I am very glad to report that the Legislature realizes this condition and gave the matter consistently favorable consideration.

With a few minor changes, the permanent force of the Bureau on January 1, 1916, consisted of 1 Director of Forestry, 7 foresters, 1 wood technologist, 1 wood expert, 1 instructor in forestry, 2 assistant foresters, 2 field assistants, 92 rangers, 4 draftsmen, and 25 clerks. In addition to this permanent force there were employed on a temporary status 1 assistant forester, 2 nurserymen (1 of whom devotes but one-third of his time to the work of the Bureau), 2 rangers, 2 draftsmen, 3 clerks, 3 messengers, 7 laborers, 1 carpenter, 2 varnishers, 17 guards, 2 watchmen, 1 chauffeur, 1 launch engineer, 1 launch patron, and 1 launch sailor.

QUARTERS.

During the early part of the year, the offices of the Bureau were transferred from the Oriente Building on Plaza Binondo to the building at No. 244 Calle Juan Luna, formerly occupied by the Philippine Museum of Ethnology. The entire upper floor was remodeled to suit the needs of the various offices of the Bureau; on the lower floor a section was partitioned off at one end as a property office and storeroom, and one at the other end for the office of the wood expert. The whole remaining part of the ground floor was left open and in it will be installed the entire permanent working collections of timber and other forest products. The new arrangement is a decided improvement over the former one, as it unites in one place all the offices, the working collections of planks, etc., and the workshop. The rooms are large, airy, and well lighted. The space for the collection, which was becoming exceedingly crowded at the time of shipping the forest exhibits to San Francisco, has been increased more than 50 per cent over the scant half of the ground floor it formerly occupied. The yard at the rear of the building is amply sufficient for the purposes of a workshop and storage room for storing and seasoning planks, logs, and other working specimens received from the provinces. The yard has also been beautified at a merely nominal expense by planting vines and shrubbery against the blank walls of the surrounding houses.

As mentioned elsewhere in this report, sufficient money has been allotted to the Bureau to complete the Forest School building at Los Baños, as well as to construct quarters for the students.

Most of the offices of the numerous forest stations in the provinces occupy private houses for which the Bureau has to pay rent, only a very few of them being accommodated in municipal or provincial buildings furnished rent free. In a few cases, where forest stations are located not in or near a town, but in the vicinity of large concessions, it has even been necessary to rent a station from the holders of the concession, a most undesirable practice, as it leaves the Bureau and its officials in the position of tenants of the licensee—that is, in a way dependent on his good will. It is easy to see that in such cases the least occasion for official friction between forest officer and licensee would lead also to strained relations between tenant and landlord, or vice versa. For this reason the Legislature was requested to furnish funds for constructing small buildings for stations in at least three or four such places, but the request was not approved. It is intended to renew the request at the

next session of the Legislature, when it is hoped that it may be approved.

INADEQUACY OF FUNDS AND PERSONNEL.

The past year has shown progress in all the activities of the Bureau, which is principally due to the interest shown by both houses of the Legislature in our work. In spite of the general economy which has become necessary because of the reduced revenue of the Government, the Bureau of Forestry this year has received a substantial increase in the appropriation, which made it possible to carry out the plans of the Director. The force and funds of the Bureau are, however, by no means sufficient to carry out all work as it should be done. In connection with this it may be mentioned that the Philippine Government employs for the administration of 16,000,000 hectares of forest land 228 people and during the last year spent ₱274,175.98, while the Japanese Government spent during 1914 ₱5,884,309 and employed in the Government Forest Service 2,873 men, the forested area of Japan being 23,000,000 hectares.

In spite of the general depression of the world's market, the scarcity of transportation, and the high transportation charges which forced a number of the large mills to reduce their output or to close down altogether, the Bureau's revenue during the past year amounted to ₱425,817.22 and the expenses incurred by the Bureau, including the maintenance of the Forest School, amounted only to ₱274,175.98 leaving a surplus in the Insular Treasury of ₱151,641.24.

W. KLEMME,
Acting Director of Forestry.

The SECRETARY OF THE INTERIOR,
Manila.

APPENDIX.

TABLE NO. 1.—*Statement of applications for homestead, purchase, and lease of public lands, certified to the Bureau of Lands as more valuable for agriculture or for forest purposes.*

[The column "Forest" indicates the number of applications for public land certified as more valuable for forest purposes and not alienable.]

Fiscal year—	Homesteads.			Sale applications.		
	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.
1905	80	6	86	8	----------	8
1906	318	16	334	20	1	21
1907	881	19	900	23	----------	23
1908	2,456	31	2,507	49	1	50
1909	1,523	187	1,710	26	3	29
1910	1,175	385	1,560	34	5	39
1911	1,528	221	1,749	46	3	49
1912	2,609	301	2,910	95	11	106
1913	2,680	269	2,949	104	30	134
1913 (July 1 to Dec. 31)	1,653	159	1,812	81	16	97
1914	4,812	685	5,497	279	36	315
1915	5,965	688	6,653	317	52	369
Total	25,680	2,987	28,667	1,082	158	1,240

Fiscal year—	Leases.			Grand Total.
	Agriculture.	Forest.	Total.	
1905	0	----------	----------	94
1906	1	----------	1	356
1907	12	----------	12	935
1908	26	----------	26	2,583
1909	27	----------	27	1,766
1910	42	2	44	1,643
1911	30	1	31	1,829
1912	47	1	48	3,064
1913	47	1	48	3,131
1913 (July 1 to Dec. 31)	41	3	44	1,953
1914	77	1	78	5,890
1915	70	1	71	7,093
Total	420	10	430	30,337

NOTE.—Total number of homestead, sale, and lease applications pending inspection December 31, 1914, 2,961; December 31, 1915, 2,243.

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species, cut and invoiced in the Philippine Islands during the fiscal years 1901 to 1905 and 1908 to 1915.*

Species.	Fiscal year—					
	1901-1905		1908	1909	1910	1911
	Total.	Average per year.				
Lauan	85,577	17,115	19,758	24,649	43,439	46,942
Apitong	49,204	9,841	13,695	9,535	20,764	21,096
Guijo	39,599	7,912	9,937	9,452	14,107	14,231
Ipil	13,347	2,670	6,908	7,926	13,717	12,296
Yacal	19,737	3,947	5,424	7,745	8,225	8,150
Molave	13,027	6,005	8,499	6,140	8,923	7,978
Narra	16,738	3,348	4,396	3,735	5,744	4,996
Tanguile	13,396	2,679	1,838	2,537	2,106	2,762
Acle	4,140	828	860	587	809	867
Macaasim	5,930	1,386	844	688	705	1,094
Dungon	9,095	1,819	2,233	1,984	2,453	1,693
Amuguis	4,932	986	1,546	696	1,039	735
Calantas	6,032	1,206	804	815	3,174	1,368
Tindalo	5,067	1,013	1,018	650	954	1,018
Supa	6,324	1,225	----------	1,312	1,062	944
Other species:						
First group	----------	----------	----------	----------	574	322
Second group	----------	----------	----------	----------	4,900	4,606
Third group	----------	----------	----------	----------	7,277	10,192
Fourth group	----------	----------	----------	----------	36,786	41,655
Total	----------	----------	----------	----------	176,758	182,945

Species.	Fiscal year—					Total 13 years and 6 months.
	1912	1913	July 1 to Dec. 31, 1913.	1914	1915	
Lauan	57,036	81,469	20,249	74,453	73,277	526,849
Apitong	28,929	32,391	12,905	32,328	38,849	259,696
Guijo	18,579	17,279	7,841	19,701	15,650	166,336
Ipil	17,237	15,791	7,535	17,602	12,089	124,448
Yacal	14,491	21,770	5,593	15,115	14,714	120,964
Molave	9,091	9,363	4,783	9,753	10,546	105,103
Narra	8,474	8,877	3,941	8,467	9,868	75,236
Tanguile	3,999	5,249	3,390	14,682	15,460	65,419
Acle	1,295	1,690	729	1,287	1,498	13,762
Macaasim	1,239	699	267	1,293	806	13,565
Dungon	1,213	931	601	2,199	1,467	23,869
Amuguis	1,108	645	252	770	612	12,326
Calantas	938	3,320	886	2,423	1,999	21,759
Tindalo	794	932	484	914	1,181	13,012
Supa	542	297	141	596	383	11,601
Mangachapuy	----------	----------	----------	1,469	1,859	3,328
Palosapis	----------	----------	----------	2,222	1,631	3,853
Other species:						
First group	707	1,000	687	2,126	2,190	----------
Second group	6,207	7,547	2,858	7,484	5,751	----------
Third group	10,688	8,066	2,747	6,787	6,308	----------
Fourth group	42,981	59,855	25,613	73,017	60,130	----------
Total	224,948	277,171	101,503	294,688	276,268	----------

TABLE NO. 3.—*Revenue derived from the sale of forest products, and expenses of the Bureau of Forestry since its organization, April 14, 1900.*

Fiscal year—	Revenue.	Expenses.	Surplus.	Expenses.
				Per cent.
1901 to 1906	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913	390,664	227,048	163,616	59
1913 (July 1 to Dec. 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
Total	5,303,707	2,859.050	2,444,657	[a]57.3

[a] Average.

TABLE NO. 4.—*Revenue from sale of forest products, January 1 to December 31, 1915.*

Provinces.	Amount.	Provinces.	Amount.
Agusan	₱1,129.34	Mindoro	₱6,856.08
Albay	7,399.05	Misamis	7,063.65
Ambos Camarines	14,766.56	Mountain	3,876.19
Antique	580.33	Nueva Ecija	7,185.74
Bataan	9,615.92	Nueva Vizcaya	345.62
Batangas	3,616.07	Occidental Negros	18,195.43
Bohol	2,125.46	Oriental Negros	3,510.27
Bulacan	4,174.30	Palawan	3,093.84
Cagayan	16,363.23	Pampanga	910.32
Capiz	3,143.94	Pangasinan	9,200.04
Cavite	308.32	Rizal	2,872.34
Cebu	4,358.87	Samar	6,939.47
Cotabato	2,648.70	Sorsogon	25,028.25
Davao	5,267.60	Sulu	1,181.40
Ilocos Norte	1,242.59	Surigao	1,903.13
Ilocos Sur	3,381.40	Tarlac	1,557.23
Iloilo	12,743.53	Tayabas	17,550.45
Isabela	8,295.00	Zambales	3,119.56
Laguna	2,056.72	Zamboanga	26,533.53
La Union	588.67		
Lanao	991.63	Total charges	380,620.52
Leyte	9,422.59	Total fines and penalties	45,196.70
Manila	152,039.22		
Mindanao and Sulu	12,635.64	Grand total	425,817.22

The above list shows the places where the forest charges were collected and not always where the products were gathered. This accounts for the large receipts shown by the principal market centers.

TABLE NO. 5.—*Timber licenses in force during the fiscal year 1915 (January 1 to December 31, 1915).*

Provinces.	Commercial licenses.					Gratuitous licenses.				
	For less than 100 cubic meters.	For 100 cubic meters and less than 1,000 cubic meters.	For 1,000 cubic meters and over.	License agreements.	Total commercial licenses.	For personal use.		For public work; second and lower groups.	Miner's gratuitous licenses.	Total.
						In communal forests.	Outside communal forests.			
Agusan	5	9	1		15		106	2		108
Albay	3	22	5		30	27	15			42
Ambos Camarines	13	57	6	1	77	5	6	2	19	32
Antique	10	1			11					
Bataan	1	21	15	1	38	1				1
Batanes										
Batangas	4	6			10		2			2
Bohol	4	3			7	28	62	8		98
Bulacan	8	22			30		6	1	8	15
Cagayan	16	66	2		84	104	195	2		301
Capiz	16	16	1		33	7	25	7		39
Cavite										
Cebu	20	5			25					
Ilocos Norte	57	5			62	31		3		34
Ilocos Sur	54	16			70	44	58			102
Iloilo	16	14			30	3	5			8
Isabela	10	40			50	105	179	4		288
Laguna	13	29	3		45		20			20
La Union	8	3			11	16	1			17
Leyte	29	41	1		71	6	139	1		146
Mindoro		43	7		50		1	1		2
Misamis	5	1	1	1	8	10	131	2		143
Mindanao and Sulu	53	9	17	2	81		50	2		52
Mountain Province	85	6	2	2	95	2	11	3	2	18
Nueva Ecija	15	34			49	5	20			25
Nueva Vizcaya	8				8		46	1		47
Occidental Negros	29	39	5	2	75	11	30			41
Oriental Negros	6	11	1		18	36	14			50
Palawan	5	16	16		37		33	1		34
Pampanga		3			3					
Pangasinan	45	34			79	85	19	2	1	107
Rizal	3	9			12	2				2
Samar	39	31	2		72	72	62			134
Sorsogon	1	57	4		62	18	46	1	1	66
Surigao	9	2	2		13		169	1	1	171
Tarlac	8	3			11		76			76
Tayabas	20	58	5	1	84	49	3	2		54
Zambales	16	5	4		25	14		3	2	19
All provinces								1		1
Total	634	737	100	10	1,481	681	1,530	50	34	2,295

TABLE No. 6.—*Report of the utilization of forest products from public forests of the Philippine Islands during the fiscal year 1915 (January 1 to December 31, 1915).*

Provinces.	Timber.					Firewood.		Charcoal.	Dyewood.	Tan bark.	Dye bark.	Wood oils.
	Group.				Total.	Class.						
	First.	Second.	Third.	Fourth.		First.	Second.					
	C. meters.	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*Kilos.*	*Kilos.*	*Kilos.*	*Liters.*
Albay	3,425	742	805	2,793	7,765	2,254	1,394	170		9,086		
Ambos Camarines	2,331	2,771	1,688	1,371	8,161	9,053	7,287			22,400	4,688	
Antique	12	4	41	85	142		24			720		
Bataan	8	1,967	22,715	9,634	34,324	1,033	3,632	105		340		
Batangas	134	13	15	193	355	1	2,734	13		8,279	4,310	
Bohol	500	59	65	788	1,412	801	1,024	13		4,325		203
Bulacan	234	202	174	2,495	3,105	632	815	367		8,489		
Cagayan	7,527	568	1,550	1,726	11,371		2,970			35,781		
Capiz	146	68	274	3,349	3,837	4,286	4,715	9		2,859	3,116	9,300
Cavite				18	18	9	1,339	113		4,119		
Cebu	201	54	111	247	613	235	74	34		3,404		
Ilocos Norte	282	115	74	273	744	22	33			1,171		
Ilocos Sur	500	787	271	250	1,808	204	1,783					
Iloilo	147	104	101	755	1,107	4,177	13,327	264	1,460,358	13,859		
Isabela	2,519	874	425	514	2,332							
Laguna	3	183	235	1,398	1,819	2	1,429	149		13,267		
La Union	116	68	5	54	243		12			1,150		
Leyte	725	560	804	2,760	4,849	1,178	1,177				1,345	91,824
Mindanao and Sulu	9,565	6,304	11,369	32,623	59,861	5,265	4,745	51		549,122		
Mindoro	1,933	3,161	140	6,265	11,499	7,181	277			555,827	15,373	
Misamis	687	196	166	698	1,747	63	236			530		
Mountain Province	285	148	22	5,038	5,493		2,997					
Negros Occidental	1,459	1,138	12,027	49,053	63,677	8,493	13,773			1,279	260	3,899
Negros Oriental	430	181	131	385	1,127	101	2,333			8,874	30	30,459
Nueva Ecija	1,227	618	115	481	2,441	7	229	27		39,680		
Nueva Vizcaya	121	76	6		203							
Palawan	8,913	1,108	71	75	10,167	798	126			190,169	32,155	1,216
Pampanga	2	27	196	104	329	108	2,199	288				
Pangasinan	1,718	1,147	379	1,522	4,766	505	3,869	8		55,114	250	
Rizal	16	36	13	224	289	153	11,541	43		2,917	2,282	
Samar	638	372	289	439	1,738	1,417	455			58,018		3,965
Sorsogon	3,892	2,433	535	3,952	10,812	9,337	44,926	670		70,704	21,812	3,582
Surigao	211	27	46	36	320	194	23			101,916		3,126
Tarlac	192	88	70	33	383		658	8		898		
Tayabas	1,741	1,518	7,085	3,503	13,847	12,613	10,293			141,891	7,271	
Zambales	247	194	847	276	1,564	305	365	287		7,370	1,600	
Total	52,087	27,911	62,860	133,410	276,268	70,427	142,814	2,619	1,460,358	1,913,558	94,492	147,574

TABLE NO. 6.—*Report of the utilization of forest products fr om public forests of the Philippine Islands during the fiscal year 1915 (January 1 to December 31, 1915)*—Continued.

Provinces.	Gum mastic.	Pitch.	Gutta-percha.	Split rattan.	Unsplit rattan.		Diliman.	Stone.	Lime-stone.	Gogo.	Salago bark.
					More than 2 cm. in diameter.	2 cm. in diameter or less.					
	Kilos.	*Kilos.*	*Kilos.*	*Kilos.*	*L. meters.*	*L. meters.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
Albay				119,993	47,215						
Ambos Camarines	195,038	8,900		634,287	193,133	1,683,177	2,720				
Antique				9,549			7,965			21	
Bataan	112			49,075	43,251	282,969	1,500			71	
Batangas				288						2,758	
Bohol				1,165			407				
Bulacan	120			10,636		12,820					
Cagayan				302,890	7,517	194,159	12,058				
Capiz	18,809			4,495			1				
Cavite							860			184	
Cebu				537			2,065				
Ilocos Norte				47				27,291	14,880	28	
Ilocos Sur				2,440	1,000	209,000		77,430	78,656		
Iloilo				3,008			3,692			40	
Isabela				200	6,550	10,590					
Laguna				3,456	102,108	1,400	1,653				
La Union									2,000	35	
Leyte				76,914	4,100	118,184	4,992				
Mindanao and Sulu	1,088,494		26,761	123,649	4,900	41,252				32	
Mindoro				75,010		56,360	25,710			370	397
Misamis	23,506		530	33,718			96				
Mountain Province				40,223							
Negros Occidental				214,317			9,931			9,159	
Negros Oriental	632			112,438	5,400		6,845				
Nueva Ecija				41,898	91,400	44,743				14,896	
Nueva Vizcaya											
Palawan	102,516			8,769	4,275	1,244,819				4,269	
Pampanga						44,600				260	
Pangasinan	2,464			4,913	6,584	53,628					
Rizal				82,064		416	878			384	
Samar				336,441	97,100		2,675				
Sorsogon	200	1,398		1,052,010	1,000		2,878			2,170	
Surigao				144,017						700	
Tarlac	645			3,727		21,440	103			19,227	
Tayabas	46,251	45,943		206,598	351,265	14,535,778	8,899				
Zambales				35,246	74,440	453,105				314	
Total	1,478,787	56,241	27,291	3,733,918	1,041,238	19,008,440	95,928	104,721	95,536	54,918	397

TABLE No. 6b.—*Report of the utilization of forest products from registered private woodlands during fiscal year 1915 (January 1 to December 31, 1915).*

Provinces.	Group.				Firewood.	Charcoal.	Tan bark.	Gogo.	Dyewood.	Dye bark.	Rattan.		Diliman.
	First.	Second.	Third.	Fourth.							Kilos.	Linear meters.	
	C. meters.	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*			*Kilos.*
Albay	2.62	3.24	103.51	32.40									
Bataan	.63	2.98	28.01	3.63	831								200
Batangas	131.33	324.68	129.42	120.38	6,122		6,940						
Bulacan					3,415								
Cavite				19.00	603	1,259							
Ilocos Norte	1.18	40.10	154.67	156.31									
Iloilo					110				3,479				
Isabela	9.69												
La Laguna			1.00	6.80	96	157							
Mindoro					6								
Negros Occidental	95.57	28.43	240.60	603.72	2,399								
Nueva Ecija	48.39	24.88	1.26	27.73			807	390			2,325	3,500	
Pampanga		8.46	18.92	77.73	42,140	24					120		
Rizal	88.55	3.17	2.72	25.16	649					2,024			
Sorsogon	23.58												
Tarlac	23.76	28.13	45.66	39.65	6,980							356,290	
Total	425.30	464.07	725.77	1,112.51	63,351	1,440	7,747	390	2,479	2,024	2,445	359,790	200

TABLE NO. 7.—*Minor products licenses in force during the fiscal year 1915 (January 1 to December 31, 1915).*

Provinces.	Firewood.	Charcoal.	Dyewood.	Tan bark and dye bark.	Wood oils.	Almaciga, resins, and others.	Gutta-percha.	Bejuco and dilliman.	Gogo.	Others.	Total.
Agusan	2					4	3	10			19
Albay	19			2		3		20		4	48
Ambos Camarines	48			9		15		112	2		186
Antique								16			16
Bataan	17	2						25	1		45
Batanes											
Batangas	7										7
Bohol	3										3
Bulacan	5	4				1		9			19
Cagayan	28			5		2		63			98
Capiz	21		1			3		4		4	33
Cavite	5										5
Cebu	9	4								2	15
Ilocos Norte	3							1		1	5
Ilocos Sur	17							5		11	33
Iloilo	46	7	5	1				7		13	79
Isabela	11										11
Laguna	4	1						7	1	2	15
La Union											
Leyte	25	3						36		10	74
Mindoro	43			35		17		52			147
Misamis	6			3		12	11	14			46
Mindanao and Sulu	91	18	2	23	1	29	28	25	1	2	220
Mountain Province	18							4		1	23
Nueva Ecija	3							27	6	1	37
Nueva Vizcaya	3										3
Negros Occidental	56			5	8	3		185	21	35	313
Negros Oriental	20	1			2	4	2	41	1	3	74
Palawan	39			35	4	18		31	5		132
Pampanga	1										1
Pangasinan	15			21		5		3			44
Rizal	29	1		4				18	1		53
Samar	27			1	4	2		53			87
Sorsogon	48	2		6	1	6		85	6		154
Surigao	9			3	2			37			51
Tarlac	2					3		4	2		11
Tayabas	54	3		17		17		61	1	1	154
Zambales	11	8		3		3		19	1	1	46
Total	745	54	8	173	22	147	44	974	49	91	2,307

TABLE NO. 8.—*Statement showing the quantity and value of wood and manufactures of wood exported from the Philippine Islands during the fiscal year 1915 (January 1 to December 31, 1915).*

		Quantity.	Value.
Timber:			
China	cubic meters	35	₱2,612
British East Indies	do	35	1,773
Hongkong	do	888	14,782
Australasia	do	5	100
Total		963	19,267
Lumber:			
United States	1,000 bd. ft	9,732	408,479
Guam	do	8	236
United Kingdom	do	326	12,059
China	do	368	15,396
British East Indies	do	509	19,277
French East Indies	do		1
Hongkong	do	154	8,196
Japan	do	26	1,155
Australasia	do	214	5,752
Total		11,337	470,551

TABLE NO. 8.—*Statement showing the quantity and value of wood and manufactures of wood exported from the Philippine Islands during the fiscal year 1915 (January 1 to December 31, 1915)*—Continued.

	Quantity.	Value.
Manufactured lumber (furniture, etc.):		
United States		17,168
Hawaii		2,057
Guam		185
United Kingdom		56
Spain		1,372
China		849
British East Indies		260
Japan		380
Australasia		107
Total		22,434
All other:		
United States		62,430
Guam		354
United Kingdom		330
Spain		915
China		15,540
British East Indies		1,369
Hongkong		2,564
Japan		2,612
Australasia		55
Total		86,169
Total		598,421

TABLE NO. 9.—*Statement showing the quantity and value of gums and resins exported from the Philippine Islands during the fiscal year 1915 (January 1 to December 31, 1915).*

	Kilos.	Value.
Copal:		
United States	344,099	₱70,736
United Kingdom	101,401	21,820
France	3,000	1,200
Italy	9,144	1,950
British East Indies	835,266	108,119
French East Indies	198	30
Japan	11,342	2,419
Australasia	525	172
Total	1,304,975	206,446
Elemi:		
United States	8,480	3,046
United Kingdom	2,900	735
Total	11,380	3,781
Gutta-percha:		
United States	7,110	6,913
United Kingdom	13,726	17,660
British East Indies	9,025	5,670
Japan	1,789	900
Total	31,650	31,143
All other:		
United States	33,001	23,869
Hongkong	7,700	1,850
Total	40,701	25,719
Total	1,388,706	267,089

TABLE NO. 10.—*Statement showing the quantity and value of wood and manufactures of wood imported into the Philippine Islands during the fiscal year 1915 (January 1 to December 31, 1915).*

	Cubic meters.	Value.
Ties for railways	None.	None.
Timber:		
United States	2,880	₱66,554
China	31	4,633
British East Indies	134	14,391
Total	3,045	85,578
Lumber:		
United States		188,565
United Kingdom		20
Germany		9,782
Italy		22
Netherlands		40,178
China		3,175
British East Indies		4,567
French East Indies		1,130
Japan		113
Total		247,552
Furniture:		
United States		96,753
United Kingdom		479
Austria-Hungary		1,412
France		912
Spain		1,092
Switzerland		6
China		31,406
British East Indies		1,019
Hongkong		42
Japan		3,819
Total		136,940
All other:		
United States		104,749
United Kingdom		24,262
France		1,550
Germany		3,224
Italy		476
Netherlands		23
Spain		1,813
Switzerland		354
China		41,027
British East Indies		580
Dutch East Indies		6
French East Indies		311
Hongkong		1,300
Japan		22,006
Korea		125
Australasia		549
Total		202,355
Total		~~561,847~~

679,425

TABLE NO. 11.—*Statement of appropriations and expenditures. Bureau of Forestry, January 1 to December 31, 1915.*

Appropriations:		
Act No. 2431	₱277,991.85	
Emergency Board, Resolution No. 15	1,758.00	
Emergency Board, Resolution No. 29	500.00	
Total		₱280,249.85
Expenditures:		
Salaries and wages	193,536.92	
Furniture and equipment	7,265.83	
Traveling expenses of personnel	30,997.65	
Rental of buildings and grounds	2,117.36	
Freight, express, and delivery service	1,696.13	
Printing and binding reports, documents, and publications	902.67	
Postal, telegraph, and cable service	4,918.89	
Illumination and power service	1,072.89	
Building repair service	500.00	
Plant and equipment repair service	1,226.09	
Contingent service	3,456.20	
Consumption of supplies and materials	13,586.54	
Contributions and gratuities	11,648.36	
Capital value of fixed assets	123.34	
Credit on account of adjustment of equipment	(1,088.04)	
Total expenditures		271,960.83
Balance		8,289.02
Appropriation for Agusan River reconnaissance (Act No. 2521)		2,500.00
Expenditures:		
Salaries and wages	4.50	
Traveling expenses of personnel	2,142.00	
Rental of buildings and grounds	29.67	
Freight, express, and delivery service	20.80	
Postal, telegraph and cable service	15.38	
Consumption of supplies and materials	2.80	
Total		2,215.15
Balance		284.85
Appropriation for Forest School building (Act No. 2494)		10,000.00
Expenditures		9,966.04
Balance		33.96

Statement of Bureau of Forestry appropriations, expenditures, and revenue for fiscal year 1915.

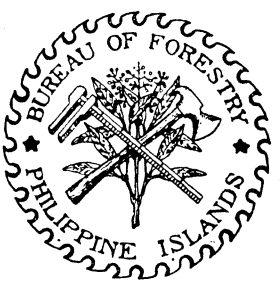
Appropriations		₱282,749.85
Revenue		425,817.22
Expenditures		274,175.98
Surplus		151,641.24
Percentage of expenditures to revenue	per cent	64

Philippine Islands. Bureau of Forestry.

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1916



ARTHUR F. FISCHER
Director of Forestry

MANILA
BUREAU OF PRINTING
1917

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY.

MANILA, P. I., *March 1, 1917.*

SIR: I have the honor to submit herewith the annual report of the Bureau of Forestry for the fiscal year 1916 covering the period from January 1 to December 31, 1916.

The Director of Forestry left Manila on January 12, 1916, on leave of absence, resigning December 1, 1916, taking advantage of the Osmeña Retirement Act, without returning to the Philippine Islands. Mr. W. Klemme, Chief of the Division of Administration, was designated as Acting Director on the date of Mr. Sherfesee's departure; Mr. Klemme resigned on April 10, 1916, also taking advantage of the Osmeña Retirement Act and the undersigned was thereupon designated as Acting Director.

PROPAGANDA.

As in the past, the Bureau of Forestry has vigorously carried on the campaign of education in acquainting the people with the forest laws and their benefits, with the goal in view of making the people realize that forest officers exist not only to detect and penalize infractors, but rather to help the individuals in every way possible in the wise use of their forest wealth, and special attention has been given to reforestation propaganda in municipalities having large grass areas. Headway has been made in getting the people themselves to realize that unwise use and destruction of the forest wealth in their municipal jurisdiction means lessened economic independence and many municipal and provincial officials have aided the Bureau in carrying out its work.

Forest officers still carry on their informal talks on their field trips and answer questions in reference to the use of the forest, possible markets for local forest products and homesteading of public lands. During the year, 1,710 informal talks were given and 56,350 people addressed at these meetings in their own dialects. Forestry leaflets outlining work of the Bureau were published in serial form in the various newspapers of the Islands. The Bureau appreciates the cordial support of the various editors in putting the matter before the public.

LEGISLATION.

Act 2608 was passed by the Legislature on February 4, 1916. This Act was repealed and replaced by section 1030 of Act 2657 (Administrative Code) which reads as follows:

Sec. 1030. *Leasing of forest land for special purposes.*—The Director of Forestry, with the approval of the Secretary of the Interior, may, upon proper terms which he may deem reasonable, lease, as herein provided, forest land as sites for sawmills and timber depots, and for the construction of hotels, sanatoria, residences, or for camps, fish-ponds, pastures, or other lawful uses, for a period not to exceed twenty years and not more than ten hectares in area, except so far as fish-ponds are concerned, in which case the maximum area shall be two hundred hectares, and pastures, the maximum of which shall be one thousand hectares, to any person or to any association of persons.

The Secretary of the Interior may grant free rights of way through any public land to enable the holder of such special permit or license to get access to the land in question.

Before this section could be put into operation it was declared unconstitutional as not being in accordance with the Act of Congress of 1902.

On July 1, 1916, Act 2657, commonly known as the Administrative Code, went into effect. All forest laws were simplified in language without lessening the power conferred under the old laws, and were included in the Code from section 1007 to section 1034.

Act 2649 was passed February 24, 1916, appropriating ₱10,000 for the reforestation of lands included in certain Government friar estates which were covered with cogon and not fit for agriculture. Accordingly steps were taken to reforest one of the most denuded estates on the Island of Cebu. A discussion of the work accomplished in this direction is given elsewhere in this report.

The sum of ₱18,000 was appropriated by Act No. 2583 passed February 4, 1916, for the completion of the administrative building of the Forest School and for the construction of quarters for the students of the School of Forestry at Los Baños.

Act No. 2613, enacted February 4, 1916, allows any producer of tobacco a gratuitous license to cut timber of the first group for the construction of warehouses exclusively for the curing of tobacco.

The Jones Act became the new organic law of the Philippine Islands August 29, 1916, and it conferred increased power in legislative matters and provided a Senate and a Legislature, but restricted legislation in regard to forests, lands, and mines to the extent that any proposed law along these lines must go to the President of the United States for final action.

During the session of the Philippine Legislature which has just closed at the time this report is being prepared, a number of bills of great importance to the Bureau were introduced, some of which passed the House of Representatives but not the Senate, while others passed both Houses.

In November, 1916, Bill No. 178 passed the House of Representatives providing for the consolidation of the Bureau of Lands and Forestry and was forwarded to the Senate.

House Bill No. 294 was introduced providing for the distribution of charges on forest products, one-half to go to the Insular Government and one-half to be equally divided between the province and municipality in which the charges were collected.

House Bill No. 459 provided an annual appropriation of ₱5,000 for the reforestation of cogonales in locust infested regions and in known breeding places of locusts on uncultivated waste lands.

House Bill No. 473 provided for an appropriation of ₱500,000 for the establishment of a Government sawmill in the Department of Mindanao and Sulu for the supplying of timber for public works.

Senate Bill No. 1, known as the infant industries bill, provided for an appropriation of one million pesos for the establishment of a paper mill, as well as certain other industries.

Senate Bill No. 17, which is essentially the same as section 1030 of Act 2657 (declared unconstitutional), was reintroduced with the provision that after approval of both houses it was to be presented to the President of the United States for final action.

NOTE.—The Legislature adjourned February 17, 1917.
House Bill No. 178 failed of passage in the Senate.
House Bills Nos. 294, 459, 473 failed of passage in the House.
Senate Bill No. 1 failed of passage.
Senate Bill No. 17 passed the Senate and House and goes to the President for action.

THE OFFICE OF THE WOOD EXPERT.

No important changes have been made in this office during this year, but a great deal of material has been added to the files in all branches of information regarding the botanical identification, local names, properties and uses of timber trees and plants producing minor products.

There have been received over 1,300 numbers of botanical specimens from forest officers and the Bureau of Science has returned from this material duplicate specimens to the number of 1,464, which have been redistributed to the forest stations in the districts where they were collected. The systematic distribution of such duplicates was begun in the latter part of 1914 and there are now over 3,000 sheets in the forest station herbarium

cases. About 200 wood specimens were collected with botanical material and, from forest officers' collections and all other sources, over 300 trade samples were received and identified.

The preparation of hand specimens and similar work has been very much facilitated by a small saw table installed in March. This has made it possible to work up much old material which it was impracticable to work up by hand, so that, whereas the previous year there were on hand for sale or distribution specimens of some 200 species, there are now available about 250. During the year there were distributed to forest stations 669 hand specimens; 2,199 were furnished to the Forest School, 600 sold, and 1,874 distributed gratis to institutions, firms, and private persons.

As against 600 phenological reports received in 1915, with some 3,000 trees reported, in 1916 there were received 800 reports, aggregating 4,764 trees named. All of these are recorded in a card index, thus adding a large mass of data regarding distribution and local names in easily accessible form. Also there have been added to the index the local names from 1,368 trees named in the 42 lists of local synonyms received during the year.

The list of foreign specimens has been increased by over 200 numbers. About 26 numbers have been added to the collection of 10-foot planks and about a dozen logs of new species have been worked up and installed.

The scaling sticks first devised and put into use in 1915 have been somewhat improved. Over 50 are now in use at various stations and are giving good service.

A number of inspections of lumber were made during the year. Among the most important were: Identification of about 4,000 ties received in Manila from Mindanao and Sulu; identification and inspection of 104,606 feet of Almon lumber for the Naval Station, Cavite; identification of various lots of logs received by Manila brokers from licensees.

In addition to the routine work of preparing wood specimens and planks and logs for the working collection, there were prepared seven sets of 6-foot planks of 13 species each, for installation in forest schools and other public institutions in the States. In connection with the rearrangement of the collections on the ground floor there has also been an unusual amount of mechanical work. Both the planks and the logs have been reviewed and relabeled in accordance with the latest botanical information, and, for the first time since the collections were begun, have been rearranged completely by families and genera. About 300 species are represented by logs and some 140 by 10-foot planks.

Bulletin No. 14, "The Commercial Woods of the Philippines: Their Preparation and Uses," came from the press in December.

LIST OF LOCAL AND OFFICIAL TREE NAMES.

During the year, there was compiled in the office of the wood expert, a list of official and local names of trees by provinces throughout the Islands. Local names of trees are so confused that sometimes a first-group tree is invoiced as a fourth-group tree by the licensees, or vice versa, and the list was prepared to avoid this confusion. Copies of the list were furnished to all provincial and municipal treasurers, district engineers, and to other parties who have to do with lumber, for their guidance in all the transactions involving the invoicing of timber under proper official and commercial names.

FOREST MAPS.

There has been a notable increase in the work of this section during the year, due partly to the greatly increased field work accomplished by the larger number of forest stations and partly to the reconnaissances that have been made.

The following table shows the number of kilometers of trail notes and of hectares of forest surveys made by the field force in each district, the trail notes already received and filed in Manila and those still pending in the district offices being shown separately.

District—	Trail notes.			Forest valuation.
	Received.	Pending.	Total.	
	Kilometers.	*Kilometers.*	*Kilometers.*	*Hectares.*
No. 1	291.12	11.29	302.41	9
No. 2	171.90	55.51	224.41	27
No. 3	36.60	4.70	41.30	
No. 4	450.37	106.36	556.73	9
No. 5	536.06	225.02	761.08	92
No. 6	493.66	504.19	997.85	28
No. 7	990.82	403.90	1,394.72	95
No. 8	538.43	169.77	708.20	62
No. 9	162.18	36.92	199.10	18
No. 10	3,296.87	59.35	3,356.22	530
No. 11	387.60	140.08	527.68	6
No. 12	70.01	19.39	89.40	2
Totals	7,425.62	1,733.48	9,159.10	878

The sketches and original notes have been arranged and filed in the map section, to be included as rapidly as possible in the base maps. Trail notes of over 5,000 kilometers and surveys of over 550 hectares have already been compiled on the 1:100,000 base maps and a number of kilometers in regions designated as concessions, reserves or forest zones have been compiled on

a scale of 1:20,000. Besides this work, there have been made 83 communal forest maps, the forest map of the reconnaissance of Agusan Province on a scale of 1:200,000 for engraving, and the map of the reconnaissance of Samar on a scale of 1:200,000.

The chief of the section spent 102 days in the field, personally supervising the work and directing the several field parties in the reconnaissance of Samar, during which he traversed almost every part of the Island. In addition, he attended a number of hearings in Negros, in connection with the Cadastral Survey and the Negros-Philippine Lumber Company, and in Laguna, relating to the Mount Maquiling Forest Reserve.

The ranger assistant to the chief of the section was in the field 171 days. During this time he inspected the forest areas claimed by private persons inside the area of the Negros-Philippine Lumber Company, the forest zone in Isabela, Occidental Negros, in connection with the Cadastral hearings, and made a forest reconnaissance of the timber in the coal bearing regions in Polillo and Alabat Islands.

The other five rangers attached to the map section spent all told 203 days on various kinds of work in the field.

The perfecting of land titles in the courts is a matter of such importance that it deserves especial attention. The lack in the maps and plans of details regarding soil cover on a parcel of land and the incompleteness of the silvical data in many regions are obstacles that appear every time there is received notice of court proceedings for the registration of a title. All of these notices have to be carefully examined to secure the necessary information regarding the location of the land and the character of the soil and vegetation in order to decide whether it is or is not advisable to take action in opposition to the claims.

The following table shows the status of the claims received during 1916:

Number of notices of hearings.

Case.	Number received.	Action taken.	No action necessary after inspection.	Pending decision of court.	Number of hectares adjudicated to Insular Government.
Cadastral	61	6	1	2	19,157.90
Ordinary	980	31	11	13	1,242.59
Total	1,041	37	12	15	20,400.49

It is noteworthy that a total of 20,400 hectares of commercial timber was practically saved from denudation for the Govern-

ment, a goodly per cent of which can be classed as permanent forest land and will finally be included in forest reserves.

As the various details of information in these cases pertain to several different bureaus, there will be submitted in the near future, for the approval of the Department Secretaries, a basic outline for an economical and practical procedure of coöperation among the several bureaus.

ESTABLISHMENT OF FOREST ZONES, THE BASIS OF FUTURE FOREST RESERVES.

The many practical difficulties encountered in establishing and proclaiming a forest reserve, such as a personnel lacking not only in numbers, but also in capacity to comprehend all the factors involved in such vast projects, the uncertainty of the legal status of many parcels of land, which often makes it impossible to decide whether they are or are not to be included in a reserve, the question of the nomadic hill people, and many others, have given rise to the plan of leading up gradually and progressively to the establishment of forest reserves by the preliminary delimiting of forest zones.

Forest zones differ from public forest only in that, in forest zones, closer and more detailed work and more exacting requirements are demanded, where any of the included area is to be alienated; the intention being eventually to have all or parts of such areas set aside as forest reserves. The delimiting of a forest zone in each region of the Archipelago is a matter of the highest importance, for on it depends the conservation and proper exploitation of our forest resources, as well as their future development and, finally, the setting aside of lands suited for permanent agriculture.

There are extensive forests the soil of which is well fitted for one or another of the crops ordinarily cultivated in the Philippines, but the quantity and quality of the stand of timber in them and their accessibility for exploitation make it more advisable to extract the timber before throwing the land open to cultivation, in order not to waste the thousands of pesos that the sale of the timber could and should bring in. These areas are generally exploited under ordinary annual licenses; in some five years or so, the licensees use all the timber, paying its value into the public purse, and the land is then certified and at the disposal of the Bureau of Lands, to be occupied by homesteaders, purchasers or lease-holders.

Through the delimitation of forest zones there would be certified to the Bureau of Lands great areas already inspected,

which could be made available at once for occupation in accordance with the Public Land Act, instead of waiting for applications for individual parcels, which frequently are not so well fitted for agricultural purposes; at the same time, reserves could be definitely established without extraordinary expense and without diminishing the utilization of forest products.

PRIVATE WOODLANDS.

The fact that the greater number of applications for registration of land titles are decided by the courts of various judicial districts in favor of the applicants and that the people are gradually gaining a better knowledge of the laws have both tended to cause a constant increase in the number of applications for registration of private forests as provided in Section 1021 of the Administrative Code. The majority of such applications are for land of a distinctly agricultural type, which, however, contains small scattered stands of timber or else scrub forest suitable for domestic uses or to supply small industries. The applications for really forested land are extremely few, and such as have been registered with the Bureau are generally based on some "Titulo Real" of the Spanish régime or a Torrens Title acquired years ago, when, not being informed of the hearings in these cases, the Bureau of Forestry could not enter any opposition.

In the case of brush land, the procedure for granting the certificates is brief, consisting merely of an examination of the title deed and an inspection of the land by a forest officer, a sketch map made by him serving at once to locate the parcel and to compare its area with that stated in the title deed in cases where the title has not been perfected or no plan exists. In case of forested land, the procedure is somewhat stricter, the applicant being obliged to submit, not only a perfected title, but also a plan showing exactly the location, boundaries and area of the land in question, the plan serving the purpose of preventing boundary disputes with licensees in adjacent public forests, or the fraudulent extraction of forest products outside of the private land. Another important purpose of the plan is that it serves the forest officer as a base for the measurement of the forest area in order to determine the amounts and kinds of timber on the property, which information is furnished the Bureau of Internal Revenue to serve to some extent as a check on fraudulent use of registry.

The following table shows the private woodlands registered in the Bureau of Forestry:

Registered private woodlands.

Calendar year.	Number of—			
	Parcels.	Hectares.	Ares.	Centares.
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,215	86	62
1910	4	8,653	85	22
1911	5	533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
Total	859	309,602	26	94

INSPECTION.

During the year detailed inspections were made of Districts 1, 6, and 10, and of the subdistrict of Surigao in District No. 8. These field inspections comprised thorough investigations of all the activities of the various forest officers stationed in the districts inspected, and at the same time direct instructions were given them concerning all the policies as well as the progress in administration of the Bureau.

The methods employed by the forest officers in their work were studied by the inspector and methods for increasing efficiency were devised. Where forest officers in the field were in doubt concerning methods of procedure, the proper solution was explained and also practical instructions given to them in field work.

The forest inspector, under special authorization from the Insular Auditor, was enabled to condemn such nonexpendable Bureau property as was unfit for service and beyond repair.

The attitude of the various forest officers toward the general public was looked into carefully, especially in the handling of caiñgin and land cases and infractions of the forest law. It is regretted that inspections of all districts could not have been made during the year, and it is hoped that during the coming year it will be possible to make an inspection of each district.

DIVISION OF ADMINISTRATION.

The division of administration is charged with the use and protection of the forests of the Philippines. The work consists of issuing licenses for forest products, inspecting the work of licensees, investigating the extent of forest resources in a given

region, and examining public land as to its fitness for agriculture or forestry.

In connection with this work, trail notes are taken, the destruction of forests through illegal clearings is prevented and the offenders when found are apprehended and brought to trial. Persons who are in unlawful possession of timber or other forest products are reported to the municipal treasurers in order that the prescribed forest charges may be collected.

Other lines of work are the securing of information concerning forest products, the collection of herbarium material and wood specimens and the investigation of forested land claimed by individuals. The last is becoming an increasingly important part of the work of a ranger.

PERSONNEL.

At the end of the year there was on the rolls of this division the following force: Four foresters, 92 rangers, and 21 guards, making a total of 117 men, an increase of 10 over the previous year. One of the foresters is absent on vacation, another is in charge of Mindanao and Sulu, where large lumbering operations are being carried on, the third is in charge of District 5, where he, in addition to his other duties, teaches forest law and procedure in the Forest School. The fourth is acting chief of the division of administration.

For administrative purposes, the Philippines are divided into 12 districts and to take advantage of better mail facilities two more districts will be established in 1917 by dividing districts which are too large. New stations were established at Ilagan, Isabela; Masinloc, Zambales; and Butuan, Agusan, making 42 forest stations in the Islands.

CLASSIFICATION OF WORK.

The accompanying table (pages 15 and 16), showing how the time of the rangers was spent, scarcely needs any explanation. Forty per cent of the time was spent in the sale of timber and forest products to licensees, for that is what the issuing of licenses and supervision of licensees really means.

About 25 per cent of the time was spent in inspecting public land in order to certify to its value as forest or agricultural land. The importance of this work will be understood when it is realized that attempts are constantly being made to claim or occupy thousands of hectares of public forest in spite of the fact that there are vast areas of public grass land suitable for agriculture.

Table showing number of days and cost of each class of work performed by the field force of the division of administration during the fiscal year 1916.

District.	Licenses.				Public lands.				Caiñgins.				Communal forests.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.
No. 1	692	47.26	₱2,884	50.98	325	22.19	₱1,309	23.14	73	4.98	₱301	5.32	60	4.11	₱219	3.87
No. 2	482	44.47	1,284	38.14	240	22.14	1,053	31.28	33	3.05	120	3.57	34	3.14	140	4.16
No. 3	195	36.38	710	49.04	15	2.80	78	5.38	46	8.58	164	11.33	1	.19	6	.41
No. 4	628	28.95	1,941	30.42	793	36.56	2,540	40.01	108	4.98	343	5.40	73	3.37	229	3.75
No. 5	761	27.16	2,207	21.62	860	30.69	2,759	27.03	189	6.75	583	5.71	45	1.61	157	1.54
No. 6	1,158	39.32	3,752	38.88	695	23.60	2,275	23.57	216	7.33	898	9.31	99	3.36	357	3.70
No. 7	2,591	38.20	7,517	37.32	1,485	21.89	4,697	23.32	383	5.64	1,296	6.43	464	6.83	1,383	6.87
No. 8	2,910	52.15	10,350	52.25	1,102	19.79	4,237	21.91	208	3.73	767	3.97	161	2.88	529	2.74
No. 9	372	43.26	1,443	42.87	237	27.56	942	27.88	22	2.56	76	2.26				
No. 10	944	40.82	2,687	40.96	376	16.25	1,105	16.84	220	9.52	653	9.64	98	4.24	285	4.34
No. 11	1,853	43.02	4,726	40.59	970	22.51	2,939	25.25	166	3.85	520	4.47	157	3.64	534	4.60
No. 12	413	28.20	1,211	24.51	414	28.28	1,482	29.98	139	9.49	550	11.13				
Total	12,999	40.24	40,712	39.65	7,512	23.26	25,416	24.76	1,803	5.58	6,251	6.09	1,192	3.69	3,839	3.74

District.	Botanical collections.				Sundays and holidays.				Leave.				Reconnaissance.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.
No. 1	19	1.30	₱90	1.58	130	8.88	₱355	6.28	152	10.39	₱466	8.24				
No. 2	24	2.22	96	2.85	136	12.55	295	8.76	101	2.76	220	6.54				
No. 3	15	2.80	32	2.21	57	10.63	171	11.81	14	2.61	36	2.49				
No. 4	30	1.38	72	1.14	300	13.83	717	11.30	184	8.48	376	5.92				
No. 5	56	1.99	145	1.42	368	13.14	1,109	10.87	190	6.78	720	7.05				
No. 6	29	.99	116	1.20	383	13.01	917	9.50	142	4.82	373	3.87	81	2.75	₱194	2.01
No. 7					927	13.66	2,059	10.23	395	5.82	910	4.52	211	3.11	638	3.16
No. 8	89	1.60	257	1.33	725	13.02	2,229	11.53	375	6.73	968	5.00				
No. 9	13	1.51	68	2.01	136	15.81	419	12.40	43	5.00	130	3.86	37	4.30	301	8.81
No. 10	27	1.16	130	1.97	271	11.71	608	9.26	88	3.80	176	2.68	250	10.80	704	10.78
No. 11	100	2.32	291	2.50	585	13.57	1,297	11.10	281	6.52	624	5.36				
No. 12	17	1.17	64	1.30	221	15.09	657	13.29	84	5.75	194	3.93				
Total	419	1.30	1,361	1.32	4,239	13.12	10,833	10.55	2,049	6.34	5,193	5.06	579	1.79	1,837	1.79

Table showing number of days and cost of each class of work performed by the field force of the division of administration during the fiscal year 1916—Continued.

District.	Nurseries.				Patrol trail and trail building.				Miscellaneous.				Travel.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.
No. 1									13	0.89	₱33	0.59				
No. 2	1	0.09	₱2	0.06					30	9.31	118	3.51	3	0.27	₱38	1.13
No. 3					139	25.93	₱115	7.94	54	10.08	136	9.39				
No. 4									53	2.45	131	2.06				
No. 5	2	.07	17	.17					327	11.67	2,494	24.44	4	.14	15	.15
No. 6					4	.14	12	.12	122	4.14	601	6.23	16	.54	155	1.61
No. 7							30	.15	288	4.25	1,122	5.57	41	.60	486	2.41
No. 8																
No. 9																
No. 10									17	.73	48	.73	21	.97	184	2.85
No. 11	15	.35	56	.48	56	1.30	162	1.40	126	2.92	495	4.25				
No. 12									176	12.02	784	15.86				
Total	18	.05	75	.07	205	.64	319	.31	1,206	3.73	5,962	5.81	85	.26	878	.85

SUMMARY.

District.	Total days.	Total cost.	District.	Total days.	Total cost.
No. 1	1,464	₱5,667	No. 8	5,570	₱19,337
No. 2	1,084	3,366	No. 9	860	3,379
No. 3	536	1,448	No. 10	2,313	6,560
No. 4	2,169	6,349	No. 11	4,309	11,644
No. 5	2,802	10,206	No. 12	1,464	4,942
No. 6	2,945	9,650			
No. 7	6,785	20,139	Total	32,301	102,677

PUBLIC LANDS.

During the year, 6,989 parcels of public land were examined and reported upon as compared with 7,093 in 1915. There are pending for inspection 3,493 parcels, an increase of 1146 over those pending at the close of the previous year, due to the greater number of requests received.

This showing is very gratifying in view of the fact that applications for public lands are at greater distances than formerly from the centers of population and the inspections require greater care, as the land applied for is generally in or near the forest.

Considerable difficulty has been encountered by forest officers in inspecting areas applied for as homesteads because of other claimants to the land, which from all appearances is unoccupied public land. Some of the principal causes of these disputes are the following:

1. Tax receipts which are popularly considered as evidence of title.
2. Abandoned caiñgins which are claimed long after all evidence of cultivation has disappeared.
3. Fraudulent sales of uncultivated public land by individuals who claim to own it.
4. The claiming of cultivated public land by others than the occupant.
5. Previous homesteaders who, through failure to occupy the land as required by law, have forfeited their rights, but oppose new occupants applying for the area.
6. Clumps of bamboo and mango trees considered as evidence of ownership.
7. Overlapping of homestead areas because of no visible boundaries or labeled monuments, and because of vague descriptions by the several applicants for the land.

The above factors interfere with a bonafide homesteader, tend to discourage him in the development of a homestead and are liable to induce him to go so far into the forest as to be sure no rival claimants will trouble him, and there make a caiñgin.

Conflicts will become more frequent as more applications are received and it is necessary to adopt a rigid policy to prevent the destruction of forests by caiñgins, which is sure to increase if homesteaders are ousted from their areas or are hampered in the development of their homesteads.

One remedy for the prevention of conflicts is vigorous prosecution in cases where perjury has been committed; another and better method is the rapid extension of the cadastral surveys already inaugurated by the Bureau of Lands.

LICENSES.

There has been an increase by 120 in the number of ordinary timber licenses. There were 1,601 licenses in 1916. Of the licenses for minor products all but gutta-percha and rattan show an increase in numbers, the most significant increase being in firewood and dyewood, both entirely due to the war. The total number of licenses granted is 2,536 as compared with 2,307 in 1915. Details will be found in Table No. 7 at the end of this report.

With the increase in the number of licensees, greater difficulty has been encountered in the location of limits for licenses. Natural boundaries are used whenever possible, but the difference in local names for the same streams, trails and other features of topography are occasionally taken advantage of by rival licensees to acquire territory assigned to their competitors.

COMMUNAL FORESTS.

Eighty-one communal forests were established during the year as compared with 63 during the year 1915. Five more are being considered and will be established soon. The total number of communal forests now amounts to 360, distributed among the different provinces as shown in the following table:

Communal forests established in the Philippine Islands up to and including the year ending December, 1916.

Province.	Established until 1915.	Established during 1916.	Total.
Agusan		1	1
Albay	6	3	9
Ambos Camarines	19	3	22
Antique	1		1
Bataan	13	1	14
Bohol	6	2	8
Cagayan	14	7	21
Capiz	9	8	17
Cebu	3		3
Ilocos Norte	14	2	16
Ilocos Sur	29	2	31
Iloilo	4	2	6
Isabela	11	2	13
Laguna	10		10
La Union	9	1	10
Leyte	8	3	11
Mindanao and Sulu	2	1	3
Misamis	7	4	11
Mountain	5	2	7
Nueva Ecija	6	3	9
Occidental Negros	5	6	11
Oriental Negros	4	6	10
Pampanga	1	1	2
Pangasinan	25	2	27
Rizal	2	1	3
Samar	20	5	25
Sorsogon	9	1	10
Surigao		5	5
Tarlac	3	2	5
Tayabas	20	5	25
Zambales	14		14
Total	279	81	360

The principal benefit of communal forests is that each municipality will have a forest for its own use, even though the surrounding country has been lumbered or cleared off for agriculture. The scarcity of forests or their remoteness from centers of population in some parts of the Philippines show the advisability of establishing communal forests before all accessible timber has been removed.

CAIÑGINS.

The number of illegal caiñgins reported during 1916 as compared with 1915 shows a decrease of 353. This can be attributed to two causes, first, to the unusual number of showers in the dry season, which decreased the number of caiñgins made, and second, to the cumulative effect of talks by rangers on the evils of indiscriminate forest destruction and on the benefits of homesteading land.

Caiñgins reported during 1916.

Province.	Reported by—		Total.	Acted on—		Total.
	Forest officers.	Municipal presidents.		Convicted.	Acquitted.	
Agusan	1		1	1		1
Albay	6		6	1		1
Ambos Camarines	66	24	90	48	3	58
Antique	3		3			
Bataan	2		2			
Batanes						
Batangas						
Bohol						
Bulacan	2		2			
Cagayan	49		49			
Capiz	25		25	9	1	10
Cavite						
Cebu	41		41			
Ilocos Norte	1		1			
Ilocos Sur	2		2	1		1
Iloilo	2		2			
Isabela						
Laguna	1		1		1	1
La Union						
Leyte	210		210			
Mindoro	20		20			
Misamis	1		1			
Mindanao and Sulu	23		23	1		1
Mountain	1		1			
Occidental Negros	39	83	122	25	2	27
Oriental Negros	26		26			
Nueva Ecija	41		41	21	1	22
Nueva Vizcaya	1		1			
Palawan	7		7			
Pampanga	1		1			
Pangasinan	10		10		1	1
Rizal						
Samar	41	3	44	12	1	13
Sorsogon	35		35			
Surigao	11		11			
Tarlac	1		1			
Tayabas	66		66	52	7	59
Zambales						
Total	735	110	845	171	17	188

NOTE.—Information at hand shows that the total number of cases tried amounts to 525, but no reports are as yet received as to the decisions rendered.

Two definite changes in policy have been made, namely, to delegate the authority for granting caiñgin permits solely to rangers and secondly, to permit caiñgins freely in brush areas, provided the occupants agree to sow their areas with ipil-ipil when they abandon them.

Section 1011 of the Administrative Code empowers municipal presidents to act as Forest Officers only when specifically authorized to do so by the Director of Forestry. In accordance with this section the following letter was sent to all municipal presidents:

NOVEMBER 2, 1916.

CIRCULAR LETTER.

To all the municipal presidents:

As section 31 of Act No. 1148, generally known as the Forest Act, has been repealed, municipal presidents are no longer authorized to issue caiñgin permits. Section 1011 of the Administrative Code takes its place. This section reads as follows:

"Sec. 1011. *President of municipality to act in absence of local forest officer.*—In the absence of a local forest officer, the president of the municipality or settlement within which timber or other forest products are cut, collected, or disposed of, shall, when so instructed by the Director of Forestry, act in his stead for the performance of duties imposed upon such officer by or under the authority of this chapter."

Therefore, if you are not definitely authorized by the Director of Forestry to do so, you should not issue any more caiñgin permits.

You are, however, responsible for the maintenance and protection of the communal forest, if your town has one.

Any applications for caiñgin permits which you may have on hand may be used by residents of your town in making applications to the local forest officer.

ARTHUR F. FISCHER,
Acting-Director of Forestry.

A method of authorizing caiñgins in brush land with the proviso that the cleared land be planted to ipil-ipil before it is abandoned is being tried out on Mount Arayat. A number of caiñgin-makers were convicted for destroying brush and young trees on the slopes of Mount Arayat. The judge suspended the prison sentence of the caiñgin-makers with the understanding that the land would be reforested by them. On the date fixed by the judge, a ranger appeared and all the caiñgin-makers went with him to their clearings and sowed ipil-ipil seed, thus preventing the spread of cogon. The caiñgin makers themselves were so pleased with this arrangement that they secured permits to clear other tracts of brush land with the understanding that they were later to plant ipil-ipil seed. In this way landless settlers who are unable to take up homesteads may still cultivate a patch of ground and incidentally, by planting ipil-ipil, increase the local supply of firewood. As to whether this

procedure can be extended to other parts of the Islands will depend upon the coöperation of the caiñgin-makers themselves.

FOREST DISTRICTS.

The following are extracts from the annual reports of the officers in charge of districts. The usual work common to all districts, and involving much time and travel, is scarcely referred to because the tables at the end of this report give a concise idea of the work done.

Before taking up the consideration of the district reports it may be well to explain the grouping of the provinces and Islands into districts. Contiguous provinces forming convenient administrative units are grouped into districts. The Visayas and southern Islands are grouped according to steamer routes.

DISTRICT NO. 1.—CAGAYAN AND ISABELA; HEADQUARTERS, APARRI.

In this district, as in almost all others, the high freight rates and scarcity of ships are blamed by small licensees for any decrease in their output. There probably has been a slight decrease in the amount of timber sent to Manila, but owing to a good tobacco crop the local demand for lumber has been excellent.

The number of timber licenses is greater by 26 than in 1915, the number now being 152, out of which number 43 of the smaller license areas were not inspected by a forest officer. There has been apparently a decrease in gratuitous licenses for personal use, but this is due to the fact that persons wanting timber for building tobacco houses now get a special license and not a gratuitous license as heretofore.

There has been no appreciable change in the number of firewood, rattan, and minor product licensees.

The number of parcels of public land inspected in accordance with the public land law shows a decrease. This scarcely means a decrease in distances traveled or expenses, as the homesteads were widely scattered. The number of parcels examined was 554 as compared with 692 in 1915 and 130 were on hand pending inspection as compared with 175 at the close of the previous year.

DISTRICT NO. 2.—NORTHWESTERN COAST OF LUZON; HEADQUARTERS, VIGAN.

There has been no increase in the number of timber licensees, but there has been more than the usual number of changes in the licensees themselves. This is accounted for by the fact that an individual wishing to build a house secures a license for timber and after cutting what he needs, does not secure a renewal. There were 143 timber licenses in force, 33 firewood,

18 limestone, 18 rattan, besides other licenses, making a total of 276 as compared with 250 for the previous year. Of the 143 timber licenses, 57 were operating on a scale large enough to warrant inspection by a ranger.

As for public lands, 376 parcels were examined and reported upon as compared with 268 in 1915. Owing to the receipt of many new requests for the examination of land in December, there are 88 cases still pending, which is practically the same number as a year ago.

The caiñgin situation is about as last year. Six caiñgin-makers were successfully prosecuted and permits were issued to 62 others, not including those on approved homesteads. Owing to the scarcity of firewood and timber in parts of the district, several municipal presidents have agreed to the plan of the officer in charge of the district to plant ipil-ipil in waste land near the town and to restock the communal forests with desirable trees.

DISTRICT NO. 3.—BENGUET; HEADQUARTERS, BAGUIO.

There has been a decrease in the number of licenses issued both for timber and firewood, but this does not mean decreased activity for the remaining licensees. One sawmill closed down while the other increased its output. About two-thirds as much lumber was cut in 1916 as in 1915. The amount of firewood cut shows an increase of 50 per cent, as 15,700 cubic meters were invoiced in 1916. Both sawmill companies utilized logging waste for firewood with the result that there was an overabundance of fuel in Baguio. In addition to regular licenses for firewood, permits were given to Igorots and others to cut firewood or burn charcoal from stumps and wind-thrown trees. In this way, many otherwise inaccessible trees were utilized.

The forest officers assisted the city of Baguio in devising a fire protection system composed of lookouts and patrols for the prevention of grass fires within the city limits. The system has worked very satisfactorily, as was also the case with the forest patrols maintained elsewhere.

Mining in the vicinity of Baguio is being prosecuted with considerable energy. One company alone consumed 2,500 cubic meters of timber for mining purposes. Due to the scarcity of timber in the vicinity of certain mines, it was necessary for the Bureau of Forestry to take entire charge of all forests and allot the timber to actual users.

DISTRICT NO. 4.—NORTH CENTRAL PLAIN OF LUZON; HEADQUARTERS, DAGUPAN.

There has been a decrease in the amount of lumber cut locally due to two reasons. First, the competition of lumber from Ma-

nila and second, the scarcity of money due to a short rice crop. The chief demand for local timber is in the form of house posts. Several licensees were refused the renewal of their licenses because of their persistence in imposing upon forest users who wanted timber for personal use.

In 1916 there were 148 timber licensees, of whom 62 were inspected: the others, cutting only nominal amounts, were not inspected. This is an increase of 41 over the number issued in 1915.

Firewood licenses showed an increase of nine over those of the previous year, but there was a decrease of 35 in other minor forest product licenses.

Eight more public land reports were inspected during the year than in 1915, a total of 1964 being inspected out of 2,135 received. The remaining 171 reports will be inspected at the first opportunity.

The ranger who visited Nueva Vizcaya reported upon the firewood plantation started over a year ago at the Salinas Reservation near Bambang. The people evaporating salt at the salt spring need a great deal of firewood and to meet this demand the Bureau of Forestry furnished the official in charge with ipil-ipil seed to start a plantation. Unfortunately the deer, being very numerous near the salt spring, destroyed all the seedlings before they were half a meter high. Another attempt will be made to reforest this reservation, for without a convenient supply of fuel it will be very expensive to evaporate the water and make salt.

The number of caiñgins reported decreased from 66 to 38. This is due to two causes, namely, to the actual decrease in the number of illegal clearings in public forests attributed to talks on the subject by rangers and, secondly, to the fact that no caiñgins were reported unless sufficient evidence and reliable witnesses were available to secure a conviction of the offender.

DISTRICT NO. 5.—SOUTH CENTRAL LUZON; HEADQUARTERS, LOS BAÑOS.

During the year 162 timber licenses were in force, of which 88 were inspected. Those which were not inspected were small licensees who were not operating or had cut only a few meters. During the preceding year there were 277 licenses in force. Due to the competition of lumber from Manila, which can easily be shipped to all railroad and lake towns, the only local demand for timber was for dug-out canoes and houseposts.

A total of 150 minor product licenses were issued during the year, which is an increase of 46 over 1915. The greatest increase was in rattan, which was largely due to the opening

of the railroad to Hondagua and the establishment of a regular boat service up the Tayabas coast. The number of firewood licensees has also increased considerably.

The number of homesteads inspected was 643, leaving a balance of 163 pending inspection. For the first time since the public land law was enacted there was a decrease in the number (57) of new homestead applications received in this district.

The caiñgin cases, as predicted a year ago, dropped in number, due to the publicity given to the law and regulations by rangers. During 1915, 84 cases were reported as against 37 this year. The amount of fines collected was three times as large as in 1915, amounting to ₱3,772. There are 29 cases awaiting trial.

The work of locating private holdings within the forest zones has continued through the year and when the cadastral surveys in the vicinity of Banahao are finished, it will be possible to establish a permanent forest reserve and throw open to homestead entry all public lands outside of the reserve.

DISTRICT NO. 6.—SOUTHERN LUZON; HEADQUARTERS, NAGA.

The typhoons of the preceding year naturally created a local demand for timber. Two mills shut down because of internal difficulties and not because of decrease in the demand for lumber.

There were 173 licenses in force during the year, of which 101, including all the important operators, were inspected. The number inspected during 1915 was 107 out of 145 licenses.

There was an increase in minor product licenses from 339 to 376, over-half being due to the increased demand for firewood.

The completion of the railroad from Manila to Calauag has resulted in a tremendous increase in the firewood, tie and pole industry in the vicinity of Calauag. Within a month after completion of the road all the available virgin mangrove swamps were occupied by licensees, who were busy selling material to the railroad or sending firewood to Manila. The mangrove swamp firewood from Calauag is now successfully competing with coal in the Manila market.

The number of parcels of public land inspected for homesteaders is 746, with 259 pending inspection, as compared with 516 inspected and 264 pending during the preceding year. The number pending is greater than it should be because of the absence of three rangers from the district for several months.

The number of caiñgin cases has decreased and out of 153 cases, 101 were convicted and 9 acquitted. The remainder are still pending trial.

The mines in the vicinity of Paracale show no decrease in the amount of timber used and fuel consumed.

DISTRICT NO. 7.—SOUTHERN VISAYAS AND ROMBLON; HEADQUARTERS, ILOILO.

The large lumber mills in this district had been forced by the war to develop local markets for their output, but this year their foreign and Manila contracts took so much of their output that their retail yards had to buy lumber in Mindanao to meet the local demands.

There were 218 timber licenses in force during the year. As usual, the larger operators received more attention than those who were cutting small amounts. Only one third of the total number of licensees were inspected, as the prevalence of cholera quarantines during the dry season hindered the work of the licensees and also of the rangers.

There has been an unprecedented demand for firewood. Rajas have been sold in some cases as high as ₱40 per thousand. The result has been a large increase in the number of firewood licensees, as well as an increase in the output. Apiapi, a despised cross-grained tidal swamp tree, is now being utilized and furnishes 80 per cent of the firewood sold in Iloilo.

During 1916, 227 firewood licenses were in force as compared with 149 in 1915. There was an increase in the number of licenses for rattan and other products, the total number being 688 for 1916, or an increase of 160.

The price of dyewood (Sibucao or Sapan wood) doubled and baling rattan sold for a time at ₱12 for a thousand pieces.

The frequent rains did much to decrease the number of illegal caingins and very probably the talks given by rangers have helped the people to realize the importance of protecting forests. In 1915, 247 cases were reported with 103 convictions. This year 112 cases were reported in which 22 convictions and one acquittal were obtained. No report has been received regarding the 89 pending cases.

The homestead work has increased, for 508 parcels were inspected and 117 were left pending as compared with 352 inspected and 198 pending in 1915.

DISTRICT NO. 8.—MINDANAO AND SULU; HEADQUARTERS, ZAMBOANGA.

The lumbering conditions in this district are much better than last year. The foreign demand for lumber, more especially in China, has kept some of the mills working overtime. In addition, there are more small licensees now than last year and fewer failed to operate. Two sawmills closed down for reasons not connected with trade conditions.

There were 158 timber licenses in force and 89 have been inspected. The previous year 117 licenses were in force and

101 inspected. The decrease in license inspection is due to the increase in land classification work.

There was also a slight increase in licenses for minor products, as 250 licenses were issued for various products during the year as compared with 231 licenses in 1915.

A new station was established at Butuan and the former station at Davao was reopened, with the result that a large amount of land classification work in connection with homesteads was finished.

The rangers have been very busy in explaining the Homestead Law to the more nomadic hill people in order that they may stop their shifting system of cultivation, which at present involves the annual destruction of many hectares of commercial forest. A liberal policy has been followed in dealing with these hill peoples and wherever possible permission has been extended to them to occupy brush land and noncommercial forest. The issuing of caingin permits by municipal presidents, while permitting farmers to clear land without delay, has resulted in the destruction of forested areas, due to the fact that the municipal officials were either unable or unwilling to inspect the land before issuing caingin permits. Some of this destruction may also have been due to the deliberate misstatements of applicants for caingin permits, who nominally applied for noncommercial forest and then used their permits as authority to destroy valuable timber.

During the year, 1,161 separate parcels of land were examined and 225 are still pending. Last year the figures were 860 for inspected parcels and 182 for pending parcels. In addition to these, several proposed colonies comprising 280 parcels were examined and certified as agricultural land.

The privately owned teak plantations which were established years ago by Moros are now being utilized. Unfortunately, severe grass fires running through the plantations while the trees were still young destroyed so many of them that those which were left developed short trunks and widespreading crowns, thus making many of the trees unsuitable for anything but ties and firewood. The Governor of Jolo is attempting to unite all private holdings in order that the plantations may be brought under scientific management and made to produce a larger percentage of saw timber.

DISTRICT NO. 9.—PALAWAN; HEADQUARTERS, PUERTO PRINCESA.

Lumbering in this district is governed solely by transportation facilities. Better freight rates and advantageous charters have induced Philippine ship owners to transfer their ships to other

routes or to sell them outright. The *Panglima*, the only regular steamer to Palawan, was sold and the doubt as to the possibility of securing another boat, as well as the withdrawal of other ships, discouraged lumbering for a while. There were 43 timber licensees, which is six more than in the preceding year. There was an increase in tanbark, rattan, and resin licenses, 191 licenses for minor products being issued as compared with 132 in the preceding year.

DISTRICT NO. 10.—NORTHERN VISAYAS; HEADQUARTERS, TACLOBAN.

The local lumber market has been good. As fishing is an important industry, the demand for poles suitable for fish weirs is constant. The cutting of such poles is restricted to noncommercial species or to forests on land which is to be cleared for agriculture. There were 226 ordinary timber licenses as compared with 178 a year ago. Of these the number inspected is less than last year, being but 119; this is due to the resignation or departure from the district of three rangers and the detail of others with the Samar reconnaissance party.

There were 273 licenses for minor products as compared with 279 for the previous year. Several licenses for stone and earth were in force because of the demand for sand and gravel needed for the reconstruction of the warehouses destroyed by fire at Tacloban. The issuing of these licenses was a necessary administrative measure, as an attempt was being made to control the supply of gravel and sand, in order to get extortionate prices. By thus making available all sand and gravel deposits on public land, the rebuilding of the Tacloban water front with concrete warehouses was assured.

The shortage in personnel has also unfavorably affected homestead work. During the year 389 homesteads were inspected and 231 were pending at the end of the year, as compared with 405 inspected and 119 pending in 1915.

A vigorous campaign was made against persons destroying forests and 264 cases were reported to the provincial fiscals. Transfers of fiscals have delayed hearings on these cases. Earnest efforts have been made during the year to issue caiñgin permits only for the clearing of land applied for under the Public Land Act, as it is apparent that the cogon area in this district is increasing due to the shifting system of cultivation formerly in vogue in Samar and Leyte.

A beginning has been made in reforestation by distributing ipil-ipil seed, and recommending its use in the reforestation of nonagricultural land. Two of the large mines in the vicinity of Aroroy, Masbate Island, have nearly exhausted their supply

of firewood and have installed oil burners rather than attempt to reforest with ipil-ipil the cogon hills in the immediate vicinity of their claims. Other miners, however, who were not in immediate need of firewood, are making provision for the future by planting ipil-ipil on waste land adjacent to their clams.

DISTRICT NO. 11.—CENTRAL LUZON; HEADQUARTERS, ORANI.

The Cadwallader-Gibson Lumber Company continues to supply the yards established in former years and as a result local licensees have been unable to sell anything but house posts (harigues) and dug-out canoes, as their hand-sawn lumber is unable to compete with the mill-sawn product. Another discouragement encountered by local licensees was the prevalence of rinderpest and the resultant quarantine of animals, which prevented the hauling of logs from the forest.

As could be expected, there has been no change in the number of timber licensees, as for years every available forest has been occupied. There has, however, been a slight increase in the number of firewood licensees and all are cutting increased amounts.

Efforts will be made to remedy the great scarcity of firewood in the sandy regions of southern Zambales through the coöperation of forest officers with municipal officials, who have requested that ipil-ipil be planted in the cogon hills and other waste land in the vicinity of their towns.

DISTRICT NO. 12.—MINDORO; HEADQUARTERS, CALAPAN.

There has not been much change in the logging conditions from those of last year. On the other hand, all mangrove swamps are occupied by firewood licensees and a number of applications have been received from persons eager to cut firewood, but for whom no areas have been located.

During the year 314 homesteads were inspected and 119 are awaiting examination. This is an increase of 57 over those of last year.

Caiñgin control is the most difficult problem of the district, for not only must the nomadic hill people be considered, but also colonists from Luzon and the Visayas. These settlers are homesteading land and in several cases they have pulled up their corner stakes and relocated them inside dense commercial forests.

The effort to prevent further destruction of forests in the western part of Mindoro has met with considerable opposition because of the peculiar system of land tenure there. Any land which has been cleared or claimed by a person is considered as his private property and is sold or inherited, even though no

tax has been paid on the land and no crops have been planted for years. The same is true of forested land, with the result that the rangers in attempting to prevent the destruction of forests are compelled to overcome imaginary claims and have to meet the hostility of the entire population, who believe that the rangers are infringing upon the rights of the people. It is still too early to say whether the talks given by rangers on this subject will have any beneficial effect.

DIVISION OF INVESTIGATION.

It has been the policy of the Bureau of Forestry to have the members of the division of investigation give the instruction in the Forest School. The offices of the division have been at Los Baños. This arrangement has provided a faculty for the school and has made it possible to do a much greater amount of investigative work than would have been possible otherwise. It has been realized that satisfactory instruction could not be given unless the instructors were actively engaged in investigative work and that the inspiration of teaching would impel the investigator to do his best work. The division has been hampered by lack of sufficient personnel; but there has, nevertheless, been a good deal accomplished.

PERSONNEL.

The personnel of the division consists of one wood technologist as chief, one instructor in forestry, one forester, six rangers, one nurseryman, two stenographers, and a varying number of temporary employees.

The forester in charge of district 5 acts as instructor in administration in the forest School and coöperates with the Division in the use of the Mount Maquiling Forest Reserve for investigation and instruction purposes.

The following are some of the more noteworthy features of the year's work:

RECONNAISSANCE.

A review was prepared of all the reconnaissance projects which have been completed by the Bureau since its organization, and recommendations were made for the standardization and improvement of future reconnaissance work.

The class in Forest Engineering II did its work this year on the Cambontoc Block of the Mount Maquiling Forest Reserve. The work was similar to that done on the Batangas and Calamba Estate Blocks during the two preceding years. This work added a great deal of valuable information in the way of stand tables, composition studies and topographic data. It supplied the in-

formation needed to complete the forest map of the Mount Maquiling Forest Reserve.

DETAILED COMPOSITION STUDIES.

The Dendrology class each year makes a very detailed study of one square kilometer on Mount Maquiling, taking a census of all the woody plants on the area. In 1913 the class work was done on kilometer 1; in 1914, on kilometer 7; in 1915, on kilometer 12. This year the work was done on kilometer 8. This work has helped greatly in our understanding of the composition of the forest, as well as being of great instructional value to the class. Besides this, each class has some work of this kind on the summer instruction trip.

INVESTIGATION OF FOREST PROBLEMS.

DENDROLOGY.

Flora of the Mount Maquiling region.—The work on this has gone forward in connection with the dendrology class work. The outlines prepared for the dendrology course constitute a preliminary manual of the Mount Maquiling Flora. It is expected that each year will see a continuation and revision of this work until it is sufficiently complete for publication by the Bureau. At the present time there are known 1,830 species of flowering plants and ferns in the Maquiling flora. Of these 613 are trees; 155, shrubs; 228, vines; and 732, herbs. It is interesting to note in this connection that, when "Important Philippine Woods" was published, in 1901, but 665 tree species were known from the entire Archipelago.

Check list of woody plants of the Philippines.—The work on this has been kept up to date, so far as publications available are concerned. At the present time the check list deals with 4,710 species. Of these 2,500 are trees; 1,394, shrubs; and 816, vines.

Rattan.—Up to the present, probably not more than one-fourth of the rattans reported as occurring in the Archipelago have been more or less certainly identified. The further identification of as yet unknown or little known species will be continued as rapidly as new material is discovered.

Rubber.—Wild rubber is at present of exceedingly little importance in the Philippines. Representatives of different rubber companies have indicated that they believe it possible to work some of our wild rubbers at a profit. A study is under way of the different wild rubber plants. As soon as it is possible to definitely identify them, samples of wild rubber will be collected and submitted to commercial firms for valuation.

Bamboo.—Growth measurements of the principal local bamboos have been made each year since 1911. A fine collection of different kinds of bamboo has been started. There are at present about 20 species growing in the collection. Studies of the yield and manner of growth of the caña boho in Bataan have also been made this year.

SILVICULTURE.

Growth studies.—The growth measurements of about 600 forest trees have been continued in the same method as in previous years.

Besides this, a much more extensive series of measurements have been made in the nurseries and plantations, which give the average growth of many of our timber trees, under certain conditions of managment.

Silvical notes.—Since 1914 the classes in Silviculture II and Silviculture III have done a good deal of work in the preparation of silvical leaflets. This has added decidedly to our knowledge of the conditions under which many species are found and the characteristics of these species. Up to this time there have been something more than 100 species treated in this work.

Reproduction studies.—Permanent reproduction plots were laid out in cut-over forests in Bataan Province in 1913. These have been examined semiannually since that time. Many very interesting details have been observed in the study of these plots; but it is not yet safe to attempt any generalization as a result of this work. The number of reproduction plots should be increased.

Planting.—Thus far, more than 600 species have been handled in the nurseries or plantations. A few of these, namely, ipil-ipil, lumbang, bagilumbang, molave, lanutan, narra, calantas, teak, and *Swietenia macrophylla,* have shown promise as plantation crops. These are being planted on a more extensive scale.

During 1916 forest plantations of the dipterocarps and rattans have been started. These forms have not shown success when planted in the open. It is expected that gutta-percha and other forest forms will be similarly planted whenever material is available.

The permanent plantations have been extended this year by 7½ hectares of new planting.

Twenty-nine hectares of cogon land in the neigborhood of the Forest School have been planted up, principally with ipil-ipil, this year. This planting is doing very well thus far, and will be permanently successful if cogon fires can be kept out for one year.

Seed Collection.—The museum collection of seeds now contains material of 543 species. This collection is very useful in connection with the class work in silviculture.

In connection with the course in silviculture in the Forest School, several special studies have been made. These have included the study of the root development of 224 species of trees, experiments with cuttings of 104 species, and experiments with forest grown seedlings of 34 species.

FOREST ENGINEERING.

Trail work on Mount Maquiling.—No extensive new trail work was done during the year, because of lack of funds; but a small section of new trail was constructed as a part of the class work in Forest Engineering III.

DURABILITY TESTS.

These tests have now continued for a number of years, and the information accumulated is of great value. It is hoped that it can be worked up for publication in the near future.

FOREST SCHOOL.

The school work of the year has been marked by the separation of the School from the College of Agriculture, the occupancy of the new Forest School building and by certain changes in personnel.

The health of students has been good throughout the year. The registration of the school has been 21 seniors and 24 juniors. These represent the following provinces: Cagayan, Ilocos Norte, Nueva Vizcaya, Tarlac, Ilocos Sur, Pangasinan, Pampanga, Bulacan, Rizal, Batangas, Tayabas, Camarines, Cebu, Iloilo, Capiz, Negros Oriental, Negros Occidental, Bataan, La Union, Zambales, Manila. Twenty-four students were given certificates in March, 1916, upon the completion of the ranger course. Nineteen of these were employed as rangers in the Bureau of Forestry with salaries ranging from ₱50 to ₱60 per month. Five private students were given certificates; three of these were from China and two from Guam. There is one private student from China in the junior class this year.

The course leading to a degree has not been given during the present year, but it is practically assured that it will be offered during the coming year.

EQUIPMENT.

The new Forest School building was completed in December, 1916. The cottages were partially completed during 1916, but work had to be stopped at the end of the year for lack of funds. There has, this year, been appropriated a sum for the completion

of the cottages and the construction of a mess hall and road. It is hoped that these will be completed before the beginning of the next school year in June.

VACATION WORK AND PRACTICE TRIP.

During April and May, 1916, the present senior class camped in that part of the Mount Maquiling Forest Reserve known as the Cambontoc Block, and finished the work necessary to the completion of an adequate topographic map of the mountain. During October and November, the senior class was taken to the cutting area of the Cadwallader-Gibson Lumber Company in Limay, Bataan, for instruction in logging and milling. Following this trip they spent three days in Manila, studying the different wood using industries and the collection of wood samples at the offices of the Bureau of Forestry.

REFORESTATION.

Reforestation in the Philippines is of paramount importance when one considers that over 40 per cent of the area of the Islands is covered with cogon grass (*Imperata exaltata*) which is useless for grazing, is a fire menace, destroys the productivity of the soil in which it grows, and, worst of all, is the breeding place of the locusts which yearly swarm over the Islands and damage crops to such an extent that the Government is compelled to spend great sums of money in trying to exterminate them. The cogon area is gradually increasing, due to the caiñgin system, and unless steps are taken to reclaim a part of this vast area yearly, it is doubtful whether any permanent progress can ever be made in the control of the locust pest.

A tree, ipil-ipil (*Leucaena glauca*), has been found which will kill out cogon grass within two years. No preparation is necessary other than burning the cogon just before the rainy season and broadcasting the seeds. The value of the trunk for firewood, the foliage for green manure, the seeds as a substitute for coffee, and, what is more important, the power of fixation of nitrogen in the soil and of remedying the toxic effects produced by cogon, commend this species above all others. The Bureau of Forestry has been principally interested in ipil-ipil for reforestation and has distributed seed through the rangers and coöperated with other Bureaus in its dissemination. Wide publicity is given and the effect is beginning to be noticed. Several municipalities have begun the reforestation of the waste cogon lands in their vicinity and private individuals have planted ipil-ipil on their cogon lands and are cutting on a one or two year rotation for firewood.

Thirty hectares on the Maquiling Forest Reserve, as well as 15 hectares on the Calamba Estate Addition to the reserve, have been reforested by the division of investigation, principally with ipil-ipil.

This year the Bureau has been in a position to attempt reforestation on a much more extensive scale, due to the special appropriation of ₱10,000 for the purpose, with the proviso that the Government friar estates having denuded non-agricultural land be reforested. The Talisay-Minglanilla Estate on the Island of Cebu was selected and the entire work confined to that, as it is located on one of the larger denuded Islands and will serve as an object lesson. The following is a short abstract of the work performed and the results obtained since the inception of the project in June, 1916.

LOCATION AND AREA.

The portion of the Talisay-Minglanilla Estate under the administration of the Bureau of Forestry lies about 3.2 kilometers N 10° E and 4.6 kilometers N 40° W from Minglanilla and Talisay, respectively. It contains about 4,095 hectares.

SOIL AND TOPOGRAPHY.

The area in general is mountainous with steep slopes. Rocks and stones are very prominent, especially in old caiñgins. In the upper part, which is not so thickly settled, the soil is loamy clay.

DRAINAGE.

The area is drained largely by Mananga River on the east, by Pingan River and Cuanos-Paquigne in the middle and by Inayagan River on the west. These usually dry out during the hot months, or have but very little water. The river beds are broken up by falls from 2 to about 15 meters in height.

BOUNDARY.

The length of cleared boundary lines is 17.2 kilometers, 14.1 kilometers of which were planted with ipil-ipil seedlings and kapok seeds. Very rocky parts were broadcasted with ipil-ipil seeds, besides being planted with seedlings to assure good results. The total number of seedlings planted was 30,230.

PLANTING.

Cogon burning.—After locating, cleaning and planting the boundaries, the cogon areas in blocks Mananga-Bulacao, Ma-

nanga-Pingan, and Pingan-Mangilamon were burned to prepare the ground for broadcasting with ipil-ipil seed.

Purchase of seeds.—Bagilumbang and ipil-ipil seeds were bought in the province of Cebu at ₱0.30 per thousand and ₱0.07 to ₱0.25 per ganta, respectively. (One ganta=3 liters.)

Labor.—The labor hire in the locality was ₱0.40 a day of nine hours. Five of the best men, who served as capatazes (foremen) were raised to ₱0.60.

Species planted.—The species planted were Lumbang (*Aleurites moluccana*), Bagilumbang (*A. trisperma*), and ipil-ipil (*Leucaena glauca*).

Methods used for planting.—The cheapest methods of planting were adopted, to lessen the cost of labor, which was very high because of the rough terrain.

Lumbang (*Aleurites moluccana*).—The seeds were treated by the "burning method" and sown directly in caiñgins. The distance between rows was 3 meters and between seeds, ½ meter.

Ipil-ipil (*Leucaena glauca*).—The cogon areas along roads were planted with ipil-ipil seedlings by means of sharp pointed dibbles. Plants were set 2 meters apart.

In burned cogon areas, seed was broadcasted at the rate of 24 liters per hectare.

TRAIL WORK.

Two trails were made: a "horse trail" (joining the Mananga River to Maghawa) and a "foot trail" (joining the Mananga River to Mount Akan.) They are 0.915 and 3.114 kilometers long, and cost ₱43 and ₱71.70, respectively.

SUMMARY OF PLANTATION IN GENERAL.

Total area under administration of Bureau of Forestry	hectares	4,095
Total area planted (approximate)	do	666
Per cent of area planted		16.26
Total amount of Ipil-ipil seeds planted	liters	9,342
Total number of Ipil-ipil seedlings planted		74,611
Total number of Bagilumbang seeds planted		163,930
Total distance of boundary cleaned	kilometers	17.2
Total distance of boundary line planted	do	14.1
Total distance of horse trail constructed	do	0.915
Total distance of foot trail constructed	do	3.114

DISCUSSION OF BLOCKS.

A. MANANGA-BULACAO BLOCK.

There are a few squatters living on the place. The land is almost all claimed by one person, Marcelo Adalo, who has his house inside the area.

The vegetation of the block is shown by the following estimates:

Total caiñgins	hectares	64
Caiñgins planted	do	37
Total cogon area planted	do	50
Second growth	do	115
Total	do	229

Planting ipil-ipil seeds.—Broadcasting: An area of about 50 hectares was broadcasted with ipil-ipil seed at the rate of 24 liters per hectare. The total amount of seed broadcasted in the block was 3,009 liters, of which 1,206 liters was used filling in blanks and 1,803 liters in broadcasting the burned cogon areas.

The average cost of broadcasting one hectare of burned cogon is about ₱0.28.

Results of ipil-ipil broadcasting.—Of the 475 ipil-ipil seedlings measured, the average height (on January 10, 1917) was 17 centimeters. The estimated number of living seedlings is 39,583,300. From these figures the average per cent of germination is 58.1.

Seedlings.—The cogon areas in the block facing the road were planted with ipil-ipil seedlings, besides being broadcasted, to insure exterminating the cogon in a short time. In this block, 60,770 seedlings were planted. Many of the plants sent out sprouts and in some places they are now crowding the cogon.

The average cost of collecting and transporting 1,000 seedlings was ₱0.93 and of planting, ₱2. The cost per M would have been lower but for the configuration of the ground and the distance from which the seedlings were obtained.

Bagilumbang planting.—In 78 caiñgins along the roads, 152,930 bagilumbang seeds were sown, in rows 3 meters apart, and 50 centimeters between seeds in the row.

Results of bagilumbang.—Of 336 bagilumbang seedlings measured the average height was 40.84 centimeters, January 19, 1917.

The total number of plants living in 500 square meters is 336.

B. MANANGA-PINGAN BLOCK.

The soil is very poor and rocky. Water supply in this locality is obtained from either Mananga or Pingan River.

The block contains the following types of vegetation:

Total caiñgins (approximate)	hectares	60
Total caiñgins planted	do	15
Cogon with brush	do	100
Shrubs and second growth	do	51
Total	do	211

Planting ipil-ipil seed.—Broadcasting: The total amount of seed broadcasted was 2,166 liters. The average cost of broadcasting one hectare was ₱0.28.

Results of ipil-ipil broadcasting.—The total number of seedlings in 5 square meters is 288; therefore, the approximate number of plants per hectare is 576,000. The average height of the seedlings on January 19, 1917, was 15 centimeters.

Bagilumbang and lumbang planting.—Only 2 hectares were planted with bagilumbang seeds in the interior of the block. All the caiñgins facing the road were planted with lumbang and bagilumbang. The total number of bagilumbang seeds planted was 11,000, of lumbang, 52,920, in 28 caiñgins.

Results of lumbang planting.—The total number of plants living in 0.14 hectare is 230, with an average height of 47 centimeters. The number of plants living in a hectare is then about 1,650. The number of living lumbang plants in the block is 21,450. The per cent of success is 40.53.

C. PINGAN-MANGILAMON BLOCK.

The Pingan-Mangilamon Block lies between the upper portion of Pingan and Mangilamon Rivers as far as Monument No. P., containing an area of 266 hectares.

The soil is loamy clay, but in places where caiñgins are old, it is very rocky.

Planting.—This block was the last one planted, burned cogon being broadcasted with ipil-ipil seed amounting to 4,467 liters.

Results of ipil-ipil broadcasting.—The number of seedlings living in 5 square meters is 283, with an average height of 11 centimeters. The estimated number of seedlings per hectare is 566,000.

INDICATED FUTURE WORK FOR THE YEAR 1917.

Broadcasting seed.—It is planned to broadcast all the cogon areas above Mangilamon River beginning from the Mananga River, following the Cebu-Toledo Road as far as Camp No. 7.

Bagilumbang planting.—All poor caiñgins inside the Mananga-Bulacao and Mananga-Pingan Blocks and the caiñgins along the road in Pingan-Mangilamon Block will be planted with bagilumbang seeds.

Stock in the nursery.—The stock in the nursery will be planted in richer caiñgins in the upper part of the estate.

DIVISION OF FOREST MANAGEMENT.

This division was organized at the beginning of 1915 for the purpose of administering the long term timber licenses, generally known as concessions, and the larger annual licenses for sawmills, granted by the Bureau of Forestry, and for fostering a

better understanding between the Director of Forestry and the lumbering interests of the Islands. The policy governing this work during 1916 has been along the same general lines as for the previous year, with such minor changes as experience has shown would work to the mutual benefit of the Government and the lumber industry.

In the administration of the large cutting areas the main objects have been: to determine the correct amount of timber cut by each licensee by scaling the logs, which is the basis for the assessment of forestry charges; to encourage the closest possible utilization of the merchantable timber; to keep the Director of Forestry informed as to the general conditions of the lumber industry; and to propose and enforce such regulations as will assure the natural reforestation of cut-over forest land. The pursuance of this work has demanded that selected rangers be stationed at each of the sawmills and that their work be inspected as frequently as possible by experienced men. One man has been constantly employed throughout the year, not only in checking the log scale, but in assisting the scalers in making mill studies and in conducting practical demonstrations in the woods and mills in order that the rangers should obtain a broader understanding of their duties. The greater part of the men chosen for this division, after two years of training, are handling the work with a great deal of credit to themselves and to the Bureau and in time promise to be valuable men in the lumbering industry, but a considerable percentage of them, although efficient in other phases of forest work, were found unfit for these particular duties.

The unanimous protest of the Philippine lumbermen relative to the log scaling law which went into effect on July 29, 1915, has gradually abated. Some of them still object on the ground that the prices charged for timber by the Government are excessive, but in general there is little complaint and all of them freely admit a decided increase in the ability of the scalers during the past two years. The policy of establishing forest stations at each of the mills and having a Bureau representative constantly on hand for the purpose of carrying on the concession and license administration, and the frequent inspections by men from the head office have done a great deal to bring about a better understanding between the Bureau and the lumbermen; and it is sincerely hoped and expected that, as our men become more familiar with the practical side of the lumbering operations, they will be of actual assistance to the operators as well as to the Government.

The personnel of this division consists of a forester as chief with headquarters in Manila, two American field assistants and fifteen rangers, all of whom are called upon to do more or less work in other divisions.

LUMBER INDUSTRY.

The Philippine lumber industry for 1916, as compared with the two previous years, has enjoyed a certain degree of prosperity which at this time sees nearly all of the mills running successfully and not a few preparing to increase their output by working double shifts or by the installation of additional machinery. This optimism and renewed activity are due to a great extent to favorable prospects for the immediate future, based on the increase in sales and the unprecedented demand for Philippine lumber, particularly in the Far East. The first year after the beginning of the European war saw the lumber business badly disrupted and it was well into the second year before a readjustment of conditions began to make it possible for the mills to operate even at a very small margin of profit.

Immediately after the beginning of the war there was but little demand for lumber and, as the dealers had a large supply on hand, the prices very naturally dropped far below normal while freight rates advanced to prohibitive figures for such commodities as lumber. Then too, there was a considerable rise in the prices of logging and milling supplies and equipment, which necessarily increased the cost of production. This factor alone would have seriously retarded the industry even under normal conditions; the final result being that many of the mills were forced to close down and those that continued to operate, with a very few exceptional cases, did so at a loss.

The universal shortage of freight space was, and is now, more keenly felt on the Atlantic than on the Pacific, and in turn, freight across the Pacific is more difficult to obtain than between Far Eastern ports with rates respectively higher, which with other conditions is working to the advantage of the Philippine lumber business. Shortly after the first of the year, the law of supply and demand began to assert itself and the one condition, that of unusually high freight rates, which more than all others had previously caused the depression, is now having an exactly opposite effect. Prohibitive Atlantic freight charges had caused a temporary shortage of African, Cuban, and Honduras mahogany in the United States and this afforded an excellent opportunity for the introduction of certain grades of Philippine lumber. Trans-Pacific freight space was high but still

obtainable and the increased price received for our lumber made it possible to ship it at a profit.

The amount of sawn lumber and timbers shipped to the United States for 1916 is 14,880 cubic meters, or roughly 6,309,000 board feet, having a declared valuation of ₱659,186 as compared with 10,451 cubic meters or 4,432,000 board feet valued at ₱469,785 for 1915. All of the shipments have proven very satisfactory and the indications are that a permanent market has been established for certain species of our woods. While exceedingly high freight rates have been paid on these shipments, the price received has more than counterbalanced them and the fact that bottoms were procurable even at greatly advanced figures proved to be a big advantage over the Mexican and African lumbermen, who were unable to obtain shipping space at any price.

Perhaps the greatest advantage achieved by the industry during the year is that the prevailing conditions made it possible for us to demonstrate our ability to supply the demand and to show with what quality of lumber that demand would be supplied. Our export shipments as compared with other timber producing countries have been few and small, but they have consisted of many species and grades which have reached a variety of markets where they have invited more or less favorable publicity amongst lumber dealers, with the result that at the present time the mills have more orders than they can fill, many of the orders being from New Zealand, Australia, India, and China, and for widely varying requirements. The principal demand, however, from these countries, excepting China, has been for railroad ties and squared logs, but of these very few have been shipped.

At the close of this year practically all of the mills are running and the prospects for 1917 are good. Many applications for timber licenses and inquiries concerning timber supply are being received by the Bureau and the indications are that there will be several additional mills operating in the Islands before the close of the year 1917.

THE CHINA MARKETS.

The unusual opportunity afforded for the extension of the Philippine lumber business in the United States, caused by the universal chaotic shipping conditions, is still present, and to an even greater extent, in the Hongkong and China markets. Because of trans-Pacific freights being scarcer and correspondingly higher than between Far Eastern ports, the large quantity of lumber from British Columbia and the Northwestern United

States which formerly went to China is now being replaced by our woods. Some of the Philippine mills are running almost exclusively on orders from China and practically all of them have booked some orders from firms in that country. New markets have been found in this field for Philippine woods in the form of barrel staves and box shooks, which would probably never have developed had shipping conditions been normal, but now, since these products have been introduced, it can be expected that by the time conditions are again settled they will have gained a sufficiently firm footing to at least survive on a competitive basis.

The amount of Philippine timber and lumber exported to Hongkong and China for the year 1916 as shown by the records of the Bureau of Customs is as follows:

	Cubic meters.	Board feet.	Value.
To China:			
Timber	190	80,560	₱9,484
Lumber	15,270	6,474,480	254,828
Total to China	15,294	6,555,040	264,312
To Hongkong:			
Timber	413	175,112	6,474
Lumber	9,255	3,924,120	92,949
Total to Hongkong	9,668	4,099,232	99,423
Total timber and lumber to Hongkong and China	24,962	10,654,272	363,735

Comparative figures for previous years are not available, but it is known that the lumber trade with China and Hongkong for 1916 nearly trebled that of 1915 and that there has been a marked advance in prices for Philippine lumber during that period.

The following is an extract from the report of the chief of the division of forest management, L. R. Stadtmiller, on the conditions of the China lumber market, which was investigated by him while on vacation during the latter part of 1916:

The Hongkong market differs from the rest of the China coast markets in that it will take many grades of all species of lumber, provided that these can be gotten down to a price which will allow their successfully competing with the Borneo woods. At the present time the market in Hongkong demands mostly logs and those of the lauans, apitong, guijo and yacal. Competition with the Borneo woods is very strong in that they sell for slightly less than the Philippine woods can be placed on this market. This, however, would not defeat the development of our lumber trade in China, as the Chinese have a preference for Philippine lumber.

At present the market demands timber mostly in the form of logs, but it is believed here also that if correctly handled the trade can gradually be broken in to take the manufactured lumber.

Throughout the rest of China, that is from Hongkong north, the market was found to differ from that of Hongkong in that practically the only use for which Philippine woods can be introduced is for interior trim, floors, etc. The middle and northern markets of China are supplied with fir and pine at a cheaper price than Philippine woods can ever be put in these markets and therefore fir and pine lumber will always hold first place for the cheaper construction woods and for woods of which seasoned material of long dimensions is demanded. In spite of the fact that it appears that Philippine woods only have a future for interior trim, etc., it is believed that the market for this purpose is practically an unlimited one, as China itself has, comparatively speaking, no hardwoods of its own. Added to this is the fact that the Chinese people have a natural love for hardwoods which they use in their houses and in making their furniture.

As an indication of the possibilities of the China lumber market, figures are submitted, obtained from the consul general at Shanghai, as to the quantity of wood imported into China and Shanghai:

Imported into all China.

	1913		1914		1915	
	Board feet.	Value.	Board feet.	Value.	Board feet.	Value.
Softwoods	159,602,884	$2,878,819	204,075,845	$3,260,201	88,372,228	$1,525,948
Hardwoods	31,928,184	795,693	42,784,872	1,017,023	25,507,848	583,710
Total	191,531,068	3,674,512	246,860,717	4,277,223	113,880,076	2,109,658

Imported into Shanghai alone.

	1914		1915	
	Board feet.	Value.	Board feet.	Value.
Softwoods	98,011,090	$1,575,724	56,437,872	$956,515
Hardwoods	16,989,984	395,866	8,429,748	177,204
Teak	1,139,052	88,859	1,715,004	110,121
Total	116,140,126	2,060,449	66,582,624	1,243,840

It will be readily seen that 1914 was the banner year, when the imports of softwoods were some 200,000,000 feet, of which 40 to 50 per cent came from the United States, the remainder coming mostly from Japan. In 1915 this importation fell to 88,000,000 feet, due almost wholly to the jump in freight rates after the war started.

LOCAL MARKET.

Although the consumption of lumber in the Islands for the past year has been about normal, there has been a decided change in the source of supply, which has materially assisted the Philippine lumber industry. The large quantity of Oregon pine previously brought into this country and sold at comparatively low prices has within the last year been entirely replaced by

native lumber. A second contract for native timber awarded by the United States Army Quartermaster's Corps for 1916 speaks well for its quality and excellence of manufacture. In 1915 that department purchased approximately three and one-half million feet of Philippine lumber and this year nearly the entire United States Army requirements for the Philippine Department, about six million board feet, has been contracted for with local mills. The unusually large amount of lumber shipped to the States and China has greatly stimulated the local market in that the yards have not been overstocked, as they have previously been, and prices have advanced to a point where lumber can be readily sold at a profit. The amount of lumber used in the Philippine Islands during 1916 is between thirty and thirty-five million board feet, which is a slight increase over the two previous years.

GRADING RULES.

It is to be regretted that the increased activity of the lumber industry has not brought about some progress in the matter of grading rules for Philippine lumber. Rules were adopted by the National Hardwood Lumber Association of the United States for certain species of this lumber going to America, but they are far from being practicable and it is doubtful if they will ever be employed. Most of the lumber going to that market is sold under the "mahogany" rules of the association, which are more applicable to Philippine lumber than any others yet formulated. The only rules existing for Philippine lumber, aside from the above mentioned, are those proposed by the Bureau of Forestry several years ago, which in themselves do not completely or adequately cover local conditions, and were intended only as a basis from which feasible rules could be developed by the manufacturers. In the absence of other rules, however, they are employed in the purchase of all native lumber used by the Army, Navy, and Insular Governments, which amounts to approximately one-fourth of our total lumber production. It is the opinion of the Bureau of Forestry that there is no action within the power of the Philippine lumbermen that would aid their business to such an extent as a lumberman's association which would formulate and adopt practicable grading rules and compel its members to adhere to them. The rules adopted by the National Hardwood Lumber Association for Philippine lauans are merely the rules for African and Mexican mahogany, slightly changed, with the obvious purpose of admitting a poorer quality of our lumber than is expected of the above-mentioned species. We feel that our lumber is not inferior and while some localities produce a large percentage of low grades, by far the

larger amount is exceedingly high grade and needs no favoritism. The rules in question are unanimously condemned by the Philippine lumbermen and it is a certainty that very little lumber will ever be sold under them.

The main exceptions taken by this Bureau to the rules are in regard to the admission of pinholes, sap, and of light and inferior lumber in the higher grades. To discuss these in the order mentioned: The rules state, "Pinworm holes not to be considered a defect in any of the grades, excepting boards showing pinworm holes, in the rough, following and tracking with the face." A large quantity of lumber is produced in this country that is reduced to a grade below common because it is perforated with pinholes and still does not show them "in the rough, following and tracking with the face." Boards that could not be used even for rough construction because of wormholes, could, under the rules for "Philippine mahogany," be classed as firsts and seconds.

Regarding sap, the rules for African and Mexican mahogany admit one inch of sap in the aggregate, but it is a fact that our larger exporters do not include it in the higher grades because of its distinctly inferior quality, although the lumber sold under the National Hardwood Lumber Association rules would admit it as a standard defect. The lumbermen feel that they would prefer to keep the grade and price up and establish a reputation for their product as a first-class article rather than drop to a lower basis by admitting pinholes and sapwood.

Lauans and tanguile from many parts of the Islands are practically free from pinholes and it would be an injustice for such lumber to compete under rules that admit pinholes in lumber so long as they do not appear parallel with the face of the boards. Furthermore, it would be very difficult to purchase lumber under these rules. A buyer in the States ordering lumber from here would have a very indefinite idea as to what he would receive. He might receive a cargo of exceptionally fine tanguile or red lauan, absolutely free from pinholes and he might obtain a shipment containing 30 to 40 per cent light colored, wormy and less valuable lumber.

The Philippine lumbermen who have been affected by them think that the rules are impracticable as the National Hardwood Lumber Association inspectors may be compelled to inspect in accordance with the rules governing the grade of "Philippine mahogany," and they are making an effort to prevent this by specifying in the sale agreement that the timber be graded according to African and Mexican mahogany rules.

OPPORTUNITIES FOR LUMBER SCHOONERS.

That the Philippine Islands offers an attractive field for the operation of several "auxiliary" lumber schooners with a carrying capacity of from two hundred and fifty thousand to three hundred and fifty thousand feet is indicated by the prevailing freight rates on lumber between Philippine ports, and the large amount of business that could be had in this particular line. For the past two years there have been considerable quantities of lumber at practically all of the mills which could not be sold because of the impossibility of obtaining boats to carry it to the market. A few small boats that make a practice of carrying lumber are proving to be good investments and as the amount of lumber awaiting shipment greatly exceeds their carrying capacity, it is only natural that they operate in but a short radius from Manila, thus leaving the more isolated mills to market their product as best they can. The larger inter-island boats are not equipped for carrying lumber and it is difficult to induce them to receive even small shipments at exhorbitant rates. The freight rate on lumber for the past year between Mindanao points and Manila is more than between Mindanao and Hongkong, and even Shanghai, which is explained by the fact that shipments to foreign ports are carried in foreign bottoms while the interisland cargos are confined to local boats. This peculiar condition is directly responsible for the large decrease in lumber shipments from Mindanao to Manila which, in turn, has resulted in an increased price of lumber to the Manila consumer without materially advancing the price to the Mindanao mill men.

The wooden-deep-sea lumber schooners with internal combustion engines have proven a success along the Northwest coast and there is no apparent reason why they would not be equally successful here. The first cost of these vessels, as well as their maintenance and operating cost, is comparatively small and their carrying capacity and range of adaptability are large. The lumber production of Mindanao at the present time justifies the construction of two or more vessels of this type with a capacity of 200 M to 250 M feet and the market that could be developed for lumber and logs in China, India, and Australia is far in excess of anything yet accomplished in the Philippine lumber industry. During the past year many orders have been received from Australia and India for logs, squared timbers and flitches which could not be accepted because of the lack of transportation. Conditions at this time are very favorable for the development of the log and timber business, particularly in Aus-

tralia, and the construction of boats capable of handling this trade in conjunction with the general inter-island lumber transportation suggests itself as an attractive business proposition.

COMPARATIVE FOREST CHARGES.

During the past two years there has been considerable dissatisfaction among the lumbermen in regard to the assessment of forestry charges. Act No. 2451, passed by the third session of the Philippine Legislature, which went into effect on July 29, 1915, states that all timber cut in public forests shall be measured in the round before it is sawed and that a reasonable deduction shall be made for natural defects by authorized scalers. As no other than metric units of measurement are recognized by the laws of the Philippine Islands, it is necessary that the contents of logs be determined in cubic meters or fractions thereof; and while it was not the intent or purpose of the law to increase forestry charges, its enforcement has, nevertheless, resulted in an increase of from 20 to 30 per cent over those received under the previous method of collection. As practically all of the Philippine lumber industry is conducted on the basis of the English "board foot" as the unit of measurement, it is only to be expected that considerable confusion and dissatisfaction results in the association of the production of the mills in board feet with the log scale in cubic meters, which represents the solid merchantable contents of the logs including the unavoidable waste in the form of slabs, sawdust, and trimmings. The following table is presented to show the forestry charge per cubic meter, log scale, per group, and the corresponding resultant charge per one thousand board feet actually paid on manufactured lumber, depending on the amount of merchantable timber wasted in sawing; or in other words, upon the closeness of utilization:

Comparison of forestry charges, cubic meters, log scale as against actual board feet produced in mills.

Charges per cubic meter.	Charges per M board feet depending on the percentages of utilization.			
	60 per cent.	65 per cent.	70 per cent.	75 per cent.
Fourth group, ₱0.50	₱1.97	₱1.81	₱1.69	₱1.57
Third group, ₱1.00	3.94	3.62	3.37	3.14
Second group, ₱1.50	5.90	5.43	5.05	4.71
First group, ₱2.50	9.85	9.05	8.42	7.86

Simply stated, these figures mean: That when sound, fourth group logs, the forestry charge on which is ₱0.50 per cubic meter (424 board feet) are sawn into lumber in a mill that utilizes but 60 per cent of the merchantable contents of the logs, the forestry charge per one thousand board feet is ₱1.97; and if

sawn in a mill that utilizes 75 per cent, the charge per thousand board feet is ₱1.57; which is equally true of all groups based on the respective price per cubic meter. A sawmill sawing first group timber, the legal forestry charge on which is ₱2.50 per cubic meter, in a mill utilizing 60 per cent of the raw material pays forestry charges at the rate of ₱9.85 per thousand board feet and if in a mill that utilizes 75 per cent, at the rate of ₱7.86 per M board feet. This method of measurement differs from that in vogue in the United States and Canada in that it compels the licensee to assume the burden of waste incident to lumber manufacture.

As a whole the above charges per thousand feet as compared with timbers of similar mechanical properties of the United States and other timber producing countries are comparatively low and it is felt that any reduction in price would have no other material results than to increase waste.

THE WORK IN BENGUET.

The Baguio Forest Nursery is maintained for the purpose of raising species which are adapted for reforestation purposes in the Mountain Province region. Reforestation is greatly needed in the Baguio City Reservation and the surrounding country; there is a large and constant demand for firewood and timber and in time the existing stands will be so thinned by constant use that they will be unable to meet the demand in the future. Of equal importance is the problem of reforesting the extensive grass areas in the mining district, where the supply of timber is diminishing and already many disputes have arisen regarding the rights of several parties to secure timber from claimed tracts. Provident companies have offered to coöperate with the Bureau of Forestry in planting up the denuded hills adjoining the mines, both to assure the future supply of mine timbers and to protect the stream sources, as some companies depend on water power to operate their mills. So far, the reforestation trials in Baguio consists of 2,777 plants, representing ten different species set out on grass land, and in broadcast sowing of Benguet pine on the same type of land.

The nursery is also used to raise ornamental shrubs and trees which are distributed free of charge to private persons and to supply the city of Baguio with the plants needed for the beautification of its parks and avenues. For this work of coöperation, the city pays the wages of five permanent laborers, which number is increased when the amount of work demands it. During 1916, 6,178 plants have been disposed of in this manner, having a sale value of about ₱4,642.15.

About a year ago, the delegate of the Secretary of the Interior made certain arrangements with this Bureau for the Baguio nursery to aid in the introduction of valuable economic trees such as cinchona, pili, and mango, for distribution to the Igorot inhabitants. Past work has shown that the native lowland species will not grow successfully in Baguio if not properly cared for, so great care is exercised in their propagation and handling. The above arrangement resulted in the assignation of ₱250 from the appropriation for Act No. 2444 to be expended in the building of glass frames in the Baguio nursery for the propagation of imported seeds. The plans for the coming year include trials of grafting and budding some of the unsuccessful exotic species on native stocks, as well as the continuation of tests of the available economic species.

The assistant forester assigned to this work of reforestation and nursery care is doing administrative work in supervising the work of the officer in charge of the Benguet district, especially in granting grazing and caiñgin permits.

With the increased use of firewood and timber in the Benguet region and the small stands of pine, it was found necessary to have a preliminary working plan for the intelligent management and administration of the remaining pine stands and the assistant forester will prepare such a plan the coming year.

This region is the centre of mining in the Philippine Islands and great inroads have been made on the stands of pine located on mining claims and on stands in the vicinity of claims. Whole areas have been denuded to such an extent that certain mining companies are not only short of timber but water as well, and furthermore, due to the geological formation existing in this region coupled with the removal of the soil cover, large slides have occurred. The larger mining companies have taken the matter up with the Bureau to coöperate in reforestation of such areas.

Another feature of the Bureau's work in connection with mining is the abuse of the mining law in staking out mining claims by so-called prospectors for the sole purpose of controlling the timber on the claims, and either selling outright the claims so staked to the larger legitimate mining companies in need of timber, or obtaining an ordinary timber license and selling the timber from their alleged claims to the operating mining companies as needed. The Bureau has changed its policy in that no more ordinary timber licenses are granted to holders of claims who are not bona fide operators, but the present mining law is so ambiguous, so lax in many of its requirements that it

is impossible under present conditions for the Bureau to control the situation as fully as is necessary. The Bureau of Forestry should be given full control of the timber on all mining claims, allowing each bona fide miner sufficient timber for proper development, the judgment of what constitutes proper development to be decided by the Government entities concerned, after which the miner should be made to take out an ordinary timber license under the Bureau's regulations. Only in this way can future supply, denuding of the country, slides and constant friction between miners as well as licensees be adequately controlled.

COÖPERATION.

During the year the Bureau of Forestry coöperated with the United States Army Quartermaster Corps and with the United States Navy in the inspection and identification of cargoes of Philippine lumber at various times, as well as coöperation in reforestation with the United States Army at Camp John Hay, Baguio, on the areas surrounding the hydroelectric plant at that place. Forest reconnaissances were made for the military authorities, principally on small areas, from the standpoint of military usefulness, of the stand of timber and minor forest products.

The various local and foreign firms dealing in lumber and minor forest products have constantly made use of this Bureau for information concerning supply and the Bureau has acted as intermediary between these firms and the various licensees for the mutual benefit of both, as well as of the Government.

The distribution of seeds for beautification work as well as plantations was carried on throughout the Islands and active coöperation with the Bureau of Public Works in its roadside planting plan was continued. Botanical collections for special purposes in making the study of economic forest species of the Islands, such as the citrus fruits, were made in coöperation with the Bureau of Agriculture in Manila and with the Department of Agriculture at Washington, D. C. Wood identification for local contractors as well as in cases of dispute in the sale of timber was continued. Work was carried on in coöperation with the Department of Mindanao and Sulu in preparing working plans for the watershed of Zamboanga, teak plantations in Jolo, and in the reconnaissance of the Lake Lanao plateau. The Bureau of Forestry coöperated with the Bureau of Science in making study of the rope industry, using bast fibers of forest trees, in the northern part of Luzon, in collecting samples of herbarium materials, etc., as well as in the collection of materials for a complete study of medicinal plants occurring in the forests

and in the testing of construction timbers. Coöperation has been carried on with several mining companies and in reforesting denuded areas for assured water supply, firewood, and future mining props. The Bureau has extensively coöperated with various manufacturing companies in trying to relieve the fuel situation brought on by the high price of coal in furnishing firewood as a substitute.

Active part was taken by the majority of the field personnel of the Bureau in coöperation with the Bureau of Education in making arbor day a success, as well as school garden days and clean-up week.

Forest officers coöperated in the locust campaign by reporting swarms of locusts to the local officials.

THE FUEL SITUATION.

During the last half of the year the price of coal has gone up to the extent that in December Japanese coal was selling at from ₱25 to ₱28 per ton and the situation became very acute; to relieve this condition the Bureau lent all its energies to increasing the output of firewood, and licenses were issued for every available area under strict regulations that the licensee would have to use his area to the fullest extent or his license would be canceled and given to one of the many other applicants.

The increase in the number of licenses, coupled with the enforced use of the license, immediately began to be felt in the larger centers by the population and to-day the United States Army is using firewood in place of coal to a considerable extent.

The Manila Railroad is using firewood in their locomotives on the south lines and the Philippine Railway on the Island of Panay is using upland firewood exclusively, the general manager stating that 2 to 2½ cords of wood equal a ton of Japanese coal, which amounts to a saving of ₱8 to ₱10 or more on every ton of coal for which wood has been substituted. Many manufacturing plants are also using firewood.

In 1915, 213,241 cubic meters of firewood were cut on which forest charges were paid, while this year charges were paid on 292,336 cubic meters, an increase of 79,095 cubic meters; this increase took place in the last three months of the year. The firewood cut from registered private woodlands, of which the Bureau has no accurate record, has been quadrupled, judging by the requests for registration and the reports submitted by rangers on the activity on private woodlands. Excluding the unknown quantity of firewood from private lands and assuming that only half of the above overproduction of 79,095 cubic meters was used

in place of coal; assuming also that 2½ cords equal a ton of coal, which gives 8.87 cubic meters of stacked wood equal to a ton of coal; and assuming finally that every ton of coal displaced by cordwood means a saving of ₱10, then we get a saving of 4,458.5 tons of coal, or ₱44,585. While it is clear that these figures cannot be considered as more than a mere indication of the facts, still they show very clearly that the encouraging of the firewood business by the Bureau of Forestry during the last year has resulted in a very large saving to the people of the Philippines.

PANAMA-PACIFIC, FORMOSA, AND SAN DIEGO EXPOSITIONS.

The exhibit of the Bureau of Forestry at the Panama-Pacific Exposition in San Francisco was productive of big results in acquainting the people of the United States and foreign countries with the forest products of the Islands which has increased the export trade in forest products this past year and created a demand for certain minor forest products beyond what could be supplied.

The Exposition closed December 20, 1915, and the exhibit was ready for shipment by January 31, 1916. A large part of the exhibit was shipped to Formosa for the exposition at Taihoku, while a small portion was exhibited at the San Diego Exposition, at both places receiving the highest praise.

CLERICAL WORK.

As stated under the heading of "Personnel," the services of the two American clerks, one of whom was performing the duties of stenographer and the other as accountant, were dispensed with and their work has been taken up by Filipino clerks already employed in the Bureau. It is gratifying to report that the result accomplished by Filipino employees was very satisfactory and showed no detriment to the service. It is only just to state that, with the increase each year of the field force of the Bureau, no increase in the clerical force has been allowed and the present clerical force is inadequate to conduct the work promptly and efficiently, necessitating constant overtime work without any prospects of remuneration by an increase in salary for increased responsibility and additional work. This condition is not conducive to holding a clerical force which has been trained in the specialized work necessary in the Bureau of Forestry and is beginning to have its effect. One Filipino clerk resigned during the year, as he was offered a position which pays more in the forestry department of British North

Borneo. Another accepted a position with the Chinese Forest Service at Peking, China, at a substantial increase in salary.

PERSONNEL.

The most important change which took place in the personnel of this Bureau was the resignation of the Director, Mr. William F. Sherfesee, whose retirement from the service was granted late in the year, and the resignation and retirement of the chief of the divison of administration in April. Several rangers, most of whom are graduates of the Forest School, resigned. One accepted a better paid position in the forest department of British North Borneo. Two accepted cadetships in the Philippine Constabulary and are now serving in that Bureau as third lieutenants, while the rest either accepted better paid positions offered them or they continued their education. One American forester, who was in charge of the largest forest district, resigned during the year, having been offered a better paid position in British North Borneo. The services of the two American clerks, one of whom was performing the duties of a stenographer and the other as accountant, were dispensed with. One Filipino stenographer was offered a position in British North Borneo and resigned; one draftsman and one messenger also resigned. The following appointments were made during the year; 21 rangers, 19 of whom were graduated at the forest School, 1 formerly employed as temporary ranger and now made permanent, and 1 reinstated; 1 American forester to replace the forester that resigned during the year; 6 clerks, 2 draftsmen and 5 messengers. The permanent force on January 1, 1917, consisted of: One forester as Acting Director, 6 foresters, 1 wood technologist, 1 wood expert, 1 chief of forest maps, 1 instructor in forestry, 2 assistant foresters, 2 field assistants, 107 rangers, 5 draftsmen, 29 clerks, and 4 messengers, besides the following employed on a temporary status: 2 nurserymen (1 of whom devotes only one-third of his time to this Bureau), 1 draftsman, 7 laborers, 1 carpenter, 1 varnisher, 24 guards, 2 watchmen, 1 chauffeur, 1 launch engineer, 1 launch patron, 1 launch sailor, and one telephone operator, making a total of 201 employees.

INSUFFICIENCY OF FUNDS AND PERSONNEL.

The past year has not only shown progress in all the activities of the Bureau, but new work had to be inaugurated because of certain conditions prevailing. The increase for certain items in the appropriations of the Bureau of Forestry for 1916 was

so small, that the force and funds of the Bureau were by no means sufficient to carry on all work as it should have been done. The Bureau spent during the past year ₱285,708.09 for the administration of 16 million hectares of forests with a maximum force of 201 employees of all grades.

To show, in comparison with other countries which in area are comparable with the Philippines, what an important position forestry occupies, in the opinion of Government officials and economists, no better example can be cited than that of Spain.

Forestry in Spain has passed through endless vicissitudes. While it is true that, as early as the thirteenth century, laws and regulations were passed for the protection of existing forests and the reforestation of waste lands, yet the practical results were almost nil; the efforts of the sovereigns in the matter bore no fruit, because there was never any responsible and competent body to carry out the provisions of the laws.

The first step toward any effective administration was taken in 1833, when a forest service was organized as a branch of the body of civil engineers, while at the same time a special school for foresters was to be established; this plan was finally put into effect in 1846.

At present the forest school has the following staff: One Director, who is also Director of the Bureau of Forestry (Inspección General de Montes), 15 foresters, belonging to the service as professors, and 4 assistant foresters as assistant professors. The organization is modeled on that of the German forest schools and the institution is the pride of the Spanish Forest Service.

The Bureau of Forestry as a separate government organization was created in 1853; it was at first under the Ministry of Public Works, later under that of Agriculture, and since 1910 under the "Ministerio de Fomento." For appointment as forester in the service, the applicant must have graduated from the school, served four years as assistant forester and, finally have carried out some special project by way of probation.

For years the forest service has had to carry on a constant struggle with other and higher powers in the Government in defense of the public forests, for the heavy public debt and other urgent financial needs have always threatened the alienation of the greater part of them. The Forest Law of 1863 specially charged the Bureau of Forestry with the regulation and administration of the public forests, but when one remembers that provincial governors, other officials appointed by these, and barrio officials had something to say about the nomination of

the rangers, it is easy to see that political influences often made forest regulations null and void.

The frequent floods and droughts of recent years and the continual deficit in the forest service, which all the activities of of the body were unable to combat, finally forced the Government to give the service the attention it had long deserved. After the loss of the colonies in 1900, among many other political changes there was effected also a radical change in the forest service. The technical administration was completely separated from all political influences, being put entirely under the direction of the Ministry of Agriculture, to concentrate all its attention and efforts on the important problems of forestry. At the same time, the appropriations both for personnel and for general expenses were considerably augmented. In 1910 there were organized 10 hydrologic divisions for the study of projects of reforestation and protection of fishing streams; these are entirely distinct from the 22 administrative forest districts.

At present the forest service consists of 200 foresters, 138 assistant foresters, and 1,750 rangers and guards. They have under their charge some 5 million hectares of forests, which are divided into 22 administrative districts. Practically coextensive with the districts are the above-mentioned hydrologic divisions. The most important parts of their work fall under demarcation of boundaries, completing the catalogue of the classified public forests, acquisition by exchange or expropriation of land valuable for forest purposes, the unification of various ancient rights, redemption of ancient free use rights, working plans, regulation of private forests situated within protective zones, reforestation of watersheds and deforested mountains in general, and the encouragement and development of arbor day.

The appropriation for the forest service in 1915 was ₱1,500,000, of which sum only 43 per cent was covered by forest revenues; the deficit of 57 per cent was incurred almost entirely in carrying out reforestation projects. The difference between these figures and those of the Philippines is striking.

The revenue of the Philippine Bureau of Forestry during the past year amounted to ₱494,447.65 and the expenses incurred by the Bureau including the maintenance of the Forest School amounted to ₱285,708.09, leaving a surplus of ₱208,739.36, or a profit of 73 per cent on the cost, and this in spite of the fact that it is estimated that 30 per cent of the revenue which the Government should collect is lost, partly through false classification of timber within the four groups and partly through incomplete

supervision of the measurement of timber on account of lack of personnel.

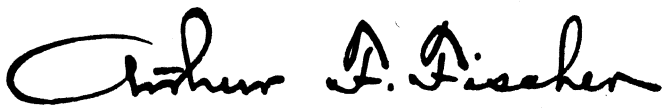
In Spain a great part of all public forests belong to the crown, to various communities, provincial governments, towns, and other official entities, beside a great number of extensive private forests. In the Philippines, on the other hand, 99 per cent of all forests belong to the Government, and only an insignificant part is private property. This difference of status brings with it the great advantage that the Government can derive much greater profits from the forest wealth and can much better regulate the proper ultimate disposition of the land.

Spain employs a large and expert technical personnel in reforesting those areas which the ignorance and improvidence of former times allowed to be devastated and to this purpose she annually devotes great sums of money, but the greater part of her public forests are accurately bounded and classified. In the Philippines, reforestation, except in a very few regions, is not a matter of such immediate necessity, but on the other hand, there is urgent need of a proper classification of the forests, in order to determine what part of our immense forest areas should be preserved either for permanent exploitation under systematic management or for protection of watersheds, and what parts should be thrown open to agriculture.

The most urgent and immediate need in the Philippines is the training of personnel of technical men, as well as subordinate officers, sufficiently numerous to carry out, gradually but constantly, the necessary work of delimiting and classifying the forests and to attend to all the needs that arise in connection with the growth of the lumber industry and other activities dependent on forest products. The present force of the Bureau of Forestry is barely able to attend to the mere routine of administrative work.

To state this somewhat more in detail: The first need, in order to make all more important lumbering regions more easily accessible and to save at once time and traveling expenses, is to increase the number of forest stations. The cost of establishing a new station, including all furniture and office supplies, plus rent for the first year, averages perhaps ₱550. This, taking into consideration the time and money spent in traveling from the present few and scattered stations to various outlying lumbering regions, is a very modest investment which would, however, soon bring in excellent returns by way of saving traveling expenses on one hand and bringing increased revenues, due to closer supervision, on the other.

Every such station needs, to attend to the work of supervision, from one to three rangers. In spite of deaths and resignations, the number of rangers graduating annually from the Forest School is sufficient to maintain the necessary increase of personnel, provided the appropriations are granted to employ them.



Director of Forestry.

The SECRETARY OF
AGRICULTURE AND NATURAL RESOURCES,
Manila.

APPENDIXES.

APPENDIX A.—FOREST RECONNAISSANCES.

SAMAR ISLAND.

In accordance with the policy of the Bureau of Forestry of detailing, during the most convenient season of the year, all the available personnel to the reconnaissance of forest regions which are almost or entirely unknown, several parties were organized and, under the supervision of the chief of the section of forest maps, made a series of reconnaissances in the Island of Samar from April to July, for the purpose of locating those forest areas which because of their importance deserve a more careful study for lumbering enterprises, those that should be preserved for the protection of streams, and tracts of land that should and can be opened up for agriculture.

A short abstract of this reconnaissance is here given, comprising the points which are of special interest to foresters and lumbermen.

The Island of Samar, the largest and easternmost of the Visayan group and the third in area among the Philippines, lies between latitude 11° 01′ and 12° 36′ north and longitude 124° 16′ and 125° 46′ east of Greenwich. Its entire area of 12,030.29 square kilometers (5,031 square miles) is very irregular and rugged in character and is cut up into deep gullies and intersected by low mountain ranges. The highest peaks do not exceed 3,000 feet.

The coast of Samar, also, is very irregular and rugged in character, being surrounded by innumerable small islands and reefs, some of which furnish good anchorage for vessels. Navigation on the northern and eastern coast is difficult and dangerous due to the fact that this coast is exposed to the northeastern monsoon.

Many rivers may be used for transportation and the Catubig is navigable for a boat drawing 12 feet of water up to Las Navas. The innumerable falls and cascades which occur in many rivers may be utilized for water power.

VEGETATION.

For the present purpose, the vegetation of the region is divided into four classes: Commercial forest, noncommercial forest, cultivated lands, and open or grass lands.

"Commercial forest" is that which contains sufficient timber to justify the establishment of a lumbering enterprise, and "noncommercial," that which could not sustain such an industry, but can supply enough timber for local uses or for small logging operations.

The following table shows the relative areas of each class and their relation to the whole area of the Island:

Type of vegetation.	Hectares.[a]	Acres.	Area.
			Per cent.
Commercial forest	983,029	2,429,065	81.71
Noncommercial forest	58,000	143,318	4.82
Cultivated lands	130,000	321,230	10.81
Open or grass lands	32,000	79,142	2.66
Total	1,203,029	2,972,755	100.00

[a] 1 hectare = 2.471 acres.

On the whole Island, 520 hectares of forest valuation surveys were carried on in 23 different forest areas and two tidal swamp areas. In order to facilitate the work, the Island was divided into 22 compartments, and the most important data regarding forest exploitation are described below, together with tables showing the result of forest valuation surveys of each compartment.

COMPARTMENT NO. 1.

The forest region south of the Lavezares-Bobon road is generally rugged in character and is traversed from south to north by several streams of little importance and by the Hingarog and Bobon Rivers, which in part may be used for the transportation of logs. In the region north of this road as well as in most of the Islands forming the Balicuatro group there are some mangrove swamp areas.

In this compartment steam logging can be carried on under an exclusive long term license to supply a sawmill with a daily output of about 25 to 30 cubic meters. A good sawmill site is available at Carañgian. The exploitation of mangrove firewood and tanbark could be carried on by a company lumbering in this compartment.

Though the logging is difficult, this is to a great extent compensated for by the quantity and quality of the stand of timber.

The stand per hectare is 124.57 cubic meters or 31,142.5 board feet, distributed among the following species in the order of their abundance: Mayapis, lauan, apitong, toog, balobo, palosapis, tanguile, mangasinoro, antipolo, macaasim, and other miscellaneous species. These estimates apply to 10,000 hectares.

COMPARTMENT NO. 2.

Valleys and basin of the Catarman River.—The valleys formed by the Paticoa, Hibabalayan, and Hinotian Rivers, which are tributaries to the Catarman, are undulating plains, with low bordering hills suitable for the cultivation of coconuts and abaca.

Logging should be restricted to small ordinary licenses, in order to retain sufficient forest cover on the hills.

By taking advantage of the river courses, transportation should offer no difficulty, but the relative quantity and quality of the stand of timber and the difficulty of shipping it out make the establishment of a sawmill in this compartment inadvisable. The stand per hectare is 79.85 cubic meters or 19,962.5 board feet, distributed among the following species in the order of their abundance: Lauan, apitong, toog, mayapis, amugis, guijo, yacal, tanguile, macaasim, catmon, and other miscellaneous species. These estimates apply to 12,000 hectares.

COMPARTMENT NO. 3.

Mondragon and Bugko Valleys.—This region is more heavily timbered than the Catarman valley and is recommended for ordinary licenses, but for local consumption only. The extraction of timber is somewhat difficult and the coast is dangerous because of the absence of a port or anchorage ground, and therefore logging for export is not recommended.

The stand per hectare is 90.29 cubic meters or 22,582.5 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), apitong, toog, mayapis, balobo, macaasim, tambalao, yacal, guijo, malaikmo, catmon, and other miscellaneous species. These estimates apply to 10,000 hectares.

COMPARTMENT NO. 4.

Valley of the Pambujan River.—This tract is traversed by the Pambujan River, which is the longest in Samar. It rises nearly 15 kilometers northeast of Calbayog and flows to Laoang Bay. Its length is more than 100 kilometers and it has numerous small tributaries.

This region is an undulating valley, with here and there level tracts along the river, inclosed by chains of hills and mountains. Although the soil of this region is not very fertile, it produces a considerable amount of abaca; from Suba north the land is somewhat more level and of better quality.

From a commercial point of view the forest in this region is of little value and therefore it is recommended that the same

be opened to agriculture, restricting the use of the forest so as to protect the streams.

The stand per hectare is 68.45 cubic meters or 17,112.5 board feet, distributed among the following species in the order of their abundance: Lauan, toog, tanguile, apitong, antipolo, guijo, narra, amuguis, catmon, macaasim, dao, and other miscellaneous species. These estimates apply to 20,000 hectares.

COMPARTMENT NO. 5.

Catubig Valley and Laoang and Batag Islands.—The Catubig valley is made up of plains of alluvial origin and is agricultural in character, particularly along the Catubig River, where there are level tracts of more than 5 kilometers in width. Coconuts, abaca and rice are the crops for which this region is best adapted.

The Catubig River is navigable for larger boats to Las Navas, and therefore the shipment of agricultural products offers no difficulty.

Logging in this part of the Island is recommended only under ordinary licenses.

At the mouth of the Catubig River there is a small delta containing about 400 hectares of tidal swamp. The quantity and quality of the stand of timber in this swamp in the order of their abundance is as follows: Api-api, bacauan, busain, tabigi, tangal. The total average stand per hectare is 22.37 cu. m.

COMPARTMENTS NOS. 6 AND 7.

Palapag and Gumay Valleys.—A careful study of this region should be made before a lumbering enterprise is started in order to ascertain whether it should be logged as a single concession, including the valley of Oras, or divided into two lesser concessions.

These valleys are topographically almost identical, consisting of level tracts from 1 to 5 kilometers wide along the coast, a part of them being swamps and the rest highland with here and there broken chains of hills. Outside of the swamps, there are many tracts planted to abaca. Immediately behind these plains, there is a plateau reaching an elevation of from 200 to 300 feet above sea level in which a good stand of timber is found, with excellent reproduction. The land as a whole offers no difficulty in the extraction of logs and even though there are a few hills scattered throughout the tract, a railroad could be put in.

A careful study should be made regarding the railroad and water transportation, as there appear to be good prospects for logging this region.

The suggested sawmill sites are at Palapag, Nabatasan River at the south of Palahan Island, in Gumay and Oras, where there are good anchorages for vessels of more than 18 feet draft.

The Oras River is affected by tides, reaching as far as Hipapad Settlement and is navigable for launches drawing 5 feet. On the banks of this river, for 8 kilometers from the mouth, the land is level with few swamps, and is generally agricultural in character.

As a whole, the forest condition is somewhat better than that of Palapag, not only because there are areas supporting good stands of Narra, Tindalo, and other valuable commercial species, but also because of the apparent ease with which it may be logged.

The stand per hectare of timber in the Palapag valley is 107.30 cubic meters or 26,825 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), red lauan, tanguile, toog, apitong, mayapis, amugis, mangasinoro, dao, guijo, malugay, and other miscellaneous species. These estimates apply to 15,000 hectares.

The stand per hectare of timber in the Oras River Valley and tributaries is 71.32 cubic meters or 17,830 board feet, distributed among the following species in the order of their abundance: Lauan, yacal, red lauan, toog, guijo, apitong, tanguile, macaasim, mangasinoro, mangachapuy, narra, antipolo, bolongeta, and other miscellaneous species. These estimates apply to 25,000 hectares.

COMPARTMENT NO. 8.

The important forest in this region lies in the Dolores River Valley, west of Maslog Settlement, but the rugged condition of the area, the swiftness of the current in the river and the numerous falls make it impossible to use the river for the transportation of logs. At the head of the river there is an extensive basin with scattered broken chains of hills, the peaks of which reach an elevation of about 200 feet above the basin.

On account of the difficulties in transportation and also because of lack of supplies at the time when this territory was examined, forest valuations were made only as far as the sitio Carayacay, in the vicinity of Maslog, but by rapid ocular estimate it was judged that in the western part the timbered area is more valuable both in quantity and quality, with an average of 250 cubic meters per hectare. The most important species are lauan, tanguile, yacal or guisoc, with a few trees of molave, narra, and tindalo, and although toog is found in considerable amounts, this species is not so abundant as in other parts of the Island.

The size of the trees in this tract is fairly good, with an

average of 15 meters in length by 75 centimeters in diameter, and the timber stand is sufficient for the establishment of a large lumbering enterprise. Reproduction is excellent.

The Dolores River being dangerous and difficult for the transportation of logs, and the distance from the center of this tract to the coast being more than 40 kilometers, the difficulties and great expense in the construction of railroad, and the absence of a port in the eastern coast, suggest that an investigation be made as to the means of transportation to the western coast, including the eastern part of compartment No. 20 or the Blanca River, a tributary of the Gandara, or to the western watersheds of Mount Hurao in the settlement of San José de Buan.

Logging to the eastward of the Maslog Settlement and in the valley of the Ulot River should be under ordinary licenses, and all level areas should be opened to settlement.

The stand per hectare is 91.01 cubic meters or 22,752.5 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), yacal, red lauan, toog, apitong, narra, guijo, pili (pagsahingin and pili), malaikmo, palosapis, dungon, amugis, tanguile, tamayuan, and other miscellaneous species. These estimates apply to 20,000 hectares.

COMPARTMENT NO. 9.

Mactaon or Malinao Valley and Sulat.—Because of the rugged condition of this tract, logging is difficult, but owing to the good stand of timber, not only in quantity but in quality, it is worth considering. Logs could be hauled either by donkey engines or by animals to those parts of the streams suitable for rafting. This tract is recommended for a small concession with a daily output of about 25 cubic meters.

Sulat Bay and the port of Libas, particularly the latter, offer good sites for sawmills.

The stand per hectare is 128.59 cubic meters or 32,147.5 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), tanguile, guijo, palomaria, yacal, almaciga, macaasim, dao, tiga, bolongeta, malugay, apitong, alupag, balobo, mangasinoro, narra, and other miscellaneous species. These estimates apply to 18,000 hectares.

COMPARTMENT NO. 10.

Beginning from the confluence of the Balangao River, the Borongan River may be used for transportation, but west of this transportation is impossible, due to stream obstructions. The rivers south of Borongan present the same difficulties.

The stand of timber is fairly good, but on account of the ruggedness of the tract, logging is difficult. This tract should be developed only under ordinary licenses.

The stand per hectare is 164.23 cubic meters or 41,057.5 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), apitong, mayapis, tanguile, mangasinoro, yacal, guijo, narra, and other micellaneous species. These estimates apply to 10,000 hectares.

COMPARTMENT NO. 11.

The Suribao Valley.—In general, the basin of the Suribao River is recommended for a concession with a daily output of about 40 cubic meters; although the tract is somewhat rugged, it has the advantage of being crossed by several tributaries of the Suribao, most of which are large enough for rafting. Another advantage is its suitability for steam logging. A mill site is available at Suribao, and a small railroad could be built to transport the lumber to the port of Lalawigan at Borongan.

The stand per hectare is 87.97 cubic meters or 21,992.5 board feet, distributed among the following species in the order of their abundance: Mayapis, apitong, yacal, lauan, tanguile, mangasinoro, tiga, narra, macaasim, and other miscellaneous species. These estimates apply to 25,000 hectares.

COMPARTMENT NO. 12.

Llorente and Tongkip Valleys.—There is a heavy stand of commercial timber, but it is inaccessible owing to the ruggedness of the tract. The parts which may be reached and for which the Llorente and Tongkip Rivers can be used for water transportation would supply a small sawmill and should be developed under ordinary licenses.

The stand per hectare is 172.80 cubic meters or 43,200 board feet, distributed among the following species in the order of their abundance: Apitong, narra, mayapis, lauan, guijo, sudyang, mangasinoro, yacal, palosapis, tanguile, palomaria, and other miscellaneous species. These estimates apply to 10,000 hectares.

COMPARTMENT NO. 13.

Not examined.

The stand per hectare is 159.35 cubic meters or 39,837.5 board feet, distributed among the following species in the order of their abundance: Sudyang, bansalagin, lauan, yacal, mayapis, macaasim and other miscellaneous species. These estimates apply to 8,000 hectares.

COMPARTMENT NO. 14.

Balangiga.—This compartment is recommended only for ordinary licenses, due to the limited stand of timber and the difficulties of transportation.

The stand per hectare is 78.39 cubic meters or 19,597.5 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), mangasinoro, tiga, yacal, guijo, agoho, sudyang, tanguile, bitanhol, macaasim, bansalagin, mangachapuy, apitong, and other miscellaneous species. These estimates apply to 10,000 hectares.

COMPARTMENT NO. 15.

The tract of land from Alabat Point to barrio Nouvilas may be logged to a slight extent, as this tract should be conserved as a protective forest. The valley of the Sohoton or Basey may be logged on a larger scale by clear cutting on those areas which are suitable for agriculture. Logging is rather difficult and the Sohoton or Basey River can be used for 10 kilometers; the forest is dotted with clearings due to caiñgin making.

The stand per hectare is 84.53 cubic meters of 21,132.5 board feet, distributed among the following species in the order of their abundance: Apitong, lauan, mangasinoro, mayapis, toog, macaasim, tiga, bitanhol, banuyo, narra, ipil, catmon, and other miscellaneous species. These estimates apply to 25,000 hectares.

COMPARTMENT NO. 16.

Santa Rita and Villareal.—A few scattered areas supporting a heavy stand of commercial species occur in this compartment, but owing to the difficulties of logging, this compartment is not suited for large operations.

The stand per hectare is 253.77 cubic meters or 63,442.5 board feet, distributed among the following species in the order of their abundance: Lauan, yacal, apitong, mangachapuy, narig, malanobo, nato, macaasim, amugis, malaikmo, baticulin, molave, tindalo, and other miscellaneous species. These estimates apply to 6,000 hectares.

COMPARTMENT NO. 17.

Daram and Buad Islands.—Buad Island is open in character and supports extensive cogon areas on lands which are not fitted for agriculture and which should be reforested.

Daram Island supports a few small forest areas with a heavy stand of trees, but there are also vast cogon areas unfitted for agricultural purposes, which should be reforested.

Logging in these islands should be restricted to licenses for local use.

The stand per hectare is 135.09 cubic meters or 33,772.5 board feet, distributed among the following species in the order of their abundance: Yacal, lauan, apitong, balobo, tanguile, guijo, palomaria, tindalo, molave, ata-ata, narra, balukanad, taluto, dao, macaasim, and other miscellaneous species. These estimates apply to 2,000 hectares.

COMPARTMENT NO. 18.

Calbiga-Wright.—The forests in this compartment have been almost destroyed by caiñgin makers; only small areas with a fairly good stand of trees occur, but as a whole, owing to difficulties in transportation, they are inaccessible to modern exploitation.

The Calbiga River is navigable for a boat of about 5 feet draft to San Mauricio, but hauling logs to this place is very difficult and can be done only by carabaos.

The stand per hectare is 170.64 cubic meters or 42,660 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), yacal, tanguile, molave, apitong, mayapis, gubas, guijo, amugis, macaasim, malaikmo, taluto, banuyo, bitanhol, oak, and other miscellaneous species. These estimates apply to 8,000 hectares.

COMPARTMENT NO. 19.

Catbalogan-Tarangnan.—This region is largely deforested, containing only scattered stands of timber difficult of access; most of the territory is covered with cogon and should be reforested.

Logging should be restricted to supplying local demands.

The stand per hectare is 92.72 cubic meters or 23,180 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), mangachapuy, apitong, tanguile, guijo, duguan, alupag, mangasinoro, dao, amugis, bitanhol, camagon, macaasim, bolongeta, and other miscellaneous species. These estimates apply to 5,000 hectares.

COMPARTMENT NO. 20.

Valley of the Gándara River and its tributaries.—Being traversed by the Gándara or Matuguinao River, this territory may be divided into two parts. The eastern part or the basin of the Blanca River, a tributary of the Gándara, including the Mapapacao, Colongcogon, and Hurao Mountains, is worth studying for the establishment of a large lumbering enterprise; even

though the tract is somewhat rugged, transportation facilities may be established without much difficulty by rail or by aerial cable to the Gándara and Blanca Rivers.

A good sawmill site is at the confluence of the Gándara and Bulao Rivers. From Gándara, sawn timber may be transported on large scows to Napalisan Island, at the mouth of the Gándara River, where a yard could be located. Vessels of more than 15 feet draft can anchor, although exposed to the southwest monsoon; such vessels could find shelter in Libucan Island, about 6 kilometers south.

There are small bays along the coast between Catbalogan and Calbayog, but on account of the water being only 6 to 12 feet deep, they are of no use.

Logging to the south and west of the Bulao River must be restricted, as forest preservation is necessary for the protection of stream flow. Lumbering in the western part of this compartment is recommended under ordinary licenses only.

The stand per hectare is 129.71 cubic meters or 32,427.5 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), tanguile, mayapis, apitong, macaasim, guijo, yacal, amugis, dao, narra, bolongeta, and other miscellaneous species. These estimates apply to 30,000 hectares.

COMPARTMENT NO. 21.

Calbayog-Oquendo.—Logging operations in the eastern part of the Oquendo Valley and in the jurisdiction of Calbayog must be rigidly restricted in order to protect the abaca plantations, and the suitable areas should be planted to this crop.

In the western part of the Oquendo Valley and in the valley of the Saymonini River to the coast, forest exploitation can only be carried on under ordinary licenses, because of difficulties in transportation due to the ruggedness of the tract.

The stand per hectare is 134.66 cubic meters or 33,665 board feet, distributed among the following species in the order of their abundance: Lauan, apitong, mayapis, mangasinoro, toog, tanguile, malaikmo, amugis, tiga, antipolo, and other miscellaneous species. These estimates apply to 15,000 hectares.

COMPARTMENT NO. 22.

Mauo and Bunglasan Valleys.—This region may be operated under a long term exclusive license for a daily output of about 40 cubic meters.

Although a considerable number of rapids and falls occur

in the Mauo and Bunglasan Rivers, they may be used for transportation to a distance of several kilometers.

Two places were selected for the mill site, namely, on the Mauo Gulf or at Barrio Erenas.

The stand per hectare is 136.83 cubic meters or 34,207.5 board feet, distributed among the following species in the order of their abundance: Lauan (bagtican, white lauan, almon), apitong, tanguile, narra, toog, macaasim, guijo, dalingdingan, pili (pagsahingin and pili), and other miscellaneous species. These estimates apply to 20,000 hectares.

COMPARTMENT NO. 23.

Capul and Dalupiri Islands.—They are considered of no forest value. The stand per hectare is 139.49 cubic meters or 34,872.5 board feet, distributed among the following species in the order of their abundance: Narra, malapaho, apitong, lauan, tamayuan and other miscellaneous species. These estimates apply to 500 hectares.

SUMMARY.

The most convenient sites for mills of larger capacity are: Carañgian, Palapag, Gumay, Oras, Sulat, Libas, Suribao, Loquilocon, Gándara, and Mauo.

Beside these, in case of a large lumbering enterprise, a combination of several compartments may be made at Palapag, Gumay, and Oras, upper valley of the Dolores and Oras, or the former with the Blanca valley, a tributary of the Gándara River.

In general, the Island of Samar is heavily timbered, but the country being subject to typhoons, the trees are somewhat damaged, particularly on the northern and eastern coast, where the trees are also smaller.

Because of the difficulties in logging due to the mountainous character of the island, the use of portable sawmills is recommended. In case there is a big demand for timber, the regions of Suribao and Llorente, Loquilocon, upper Ulot and Concord, Dolores and Gándara, which contain enough timber to support a large lumbering operation, should be studied to solve the problems of logging.

The central part of the island, between Calbiga and Borongan, as well as the regions which are not readily accessible for timber exploitation, contain extensive areas of Almaciga trees which, under the proper methods, may be exploited for resin. This product, if taken out together with rattan, would bring good returns.

The valleys of Bobon, Catarman, Bugko, Pambujan, Catubig, Oras to Hipapad, Dolores to Maslog, Ulot to Tula, Tubig or Malinao to Concord, Basey or Sohoton, Silaga to San Eduardo, Calbiga to Abaca and Buluan, Oquendo to Tarabucan, and Saymonini to Dao and Macatingog should be opened up more to agriculture with no other forest limitations than those necessary for the protection of streams and the prevention of erosion.

During this reconnaissance an investigation was also made regarding the general conditions of the mangrove swamp forests; the tables and estimates for these have not been finished.

Small reconnaissances have also been made on the Islands of Polillo and Alabat.

APPENDIX B.—STATISTICAL TABLES.

TABLE NO. 1.—*Statement of the certifications made to the Bureau of Lands regarding the agricultural or forest value of public land applied for as homesteads or for purchase or lease.*

Fiscal year.	Homesteads.			Sale applications.		
	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.
1905	80	6	86	8		8
1906	318	16	334	20	1	21
1907	881	19	900	23		23
1908	2,456	51	2,507	49	1	50
1909	1,523	187	1,710	26	3	29
1910	1,175	385	1,560	34	5	39
1911	1,528	221	1,749	46	3	49
1912	2,609	301	2,910	95	11	106
1913	2,680	269	2,949	104	30	134
1913 (July 1 to Dec. 31)	1,653	159	1,812	81	16	97
1914	4,812	685	5,497	279	36	315
1915	5,965	688	6,653	317	52	369
1916	6,015	670	6,685	227	18	245
Total	31,695	3,657	35,352	1,309	176	1,485

Fiscal year.	Leases.			Grand total.
	Agriculture.	Forest.	Total.	
1905	0			94
1906	1		1	356
1907	12		12	935
1908	26		26	2,583
1909	27		27	1,766
1910	42	2	44	1,643
1911	30	1	31	1,829
1912	47	1	48	3,064
1913	47	1	48	3,131
1913 (July 1 to Dec. 31)	41	3	44	1,953
1914	77	1	78	5,890
1915	70	1	71	7,093
1916	55	4	59	6,989
Total	475	14	489	37,326

NOTE.—Total number of homestead, sale, and lease applications pending inspection December 31, 1914, 2,961; December 31, 1915, 2,243; December 31, 1916, 3,493.

This increase in pending homesteads is due to the increase in the number of requests received from the Bureau of Lands.

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species, cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1916.*

Species.	Fiscal year—				
	1910	1911	1912	1913	July 1 to Dec. 13, 1913.
Lauan	43,439	46,942	57,036	81,469	20,249
Apitong	20,764	21,096	28,929	32,391	12,905
Tanguile	2,106	2,762	3,999	5,249	3,390
Guijo	14,107	14,231	18,579	17,279	7,841
Yacal	8,225	8,150	14,491	21,770	5,593
Ipil	13,717	12,296	17,237	15,791	7,535
Molave	8,923	7,978	9,091	9,363	4,783
Narra	5,744	4,996	8,474	8,877	3,941
Calantas	3,174	1,368	938	3,320	886
Palosapis					
Mangachapuy					
Macaasim	705	1,094	1,239	699	267
Dungon	2,453	1,693	1,213	931	601
Tindalo	954	1,018	794	932	484
Acle	809	867	1,295	1,690	729
Amugis	1,039	735	1,108	645	252
Supa	1,062	944	542	297	141
Betis					
Malugay					
Other species:					
First group	574	322	707	1,000	687
Second group	4,900	4,606	6,207	7,547	2,858
Third group	7,277	10,192	10,688	8,066	2,747
Fourth group	36,786	41,655	42,981	59,855	25,613
Total	176,758	182,945	224,948	277,171	101,503

Species.	Fiscal year—			
	1914	1915	1916	Total 1910 to 1916.
Lauan	74,453	73,277	107,634	504,499
Apitong	32,328	38,849	52,529	249,326
Tanguile	14,682	15,460	28,961	76,609
Guijo	19,701	15,650	16,685	124,073
Yacal	15,115	14,714	16,471	104,529
Ipil	17,602	12,089	14,147	110,414
Molave	9,753	10,546	10,788	71,225
Narra	8,467	9,868	7,970	58,337
Calantas	2,423	1,999	4,574	18,682
Palosapis	2,222	1,631	2,723	6,576
Mangachapuy	1,469	1,859	2,666	5,994
Macaasim	1,293	806	1,322	7,425
Dungon	2,199	1,467	1,127	11,684
Tindalo	914	1,181	1,115	7,392
Acle	1,287	1,498	1,088	9,263
Amugis	770	612	520	5,681
Supa	596	383	162	4,127
Betis			158	158
Malugay			44	44
Other species:				
First group	2,196	2,190	2,916	10,522
Second group	7,484	5,751	6,454	45,807
Third group	6,787	6,308	4,694	56,749
Fourth group	73,017	60,130	56,694	396,731
Total	294,688	276,268	341,442	1,935,847

TABLE NO. 3.—*Revenue derived from the sale of forest products, and expenditures of the Bureau of Forestry since its organization, April 14, 1900.*

Fiscal year—	Revenue.	Expenses.	Surplus.	Expenses.
				Per cent.
1901 to 1906	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913	390,664	227,048	163,616	59
1913 (July 1 to Dec. 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
Total	5,798,154	3,144,758	2,653,396	[a]57.33

[a] Average.

TABLE NO. 4.—*Revenue from sale of forest products, January 1 to December 31, 1916.*

Provinces.	Amount.	Provinces.	Amount.
Agusan	₱2,731.10	Misamis	₱6,049.80
Albay	7,582.01	Mountain	5,005.56
Ambos Camarines	13,807.46	Negros Occidental	18,955.07
Antique	409.20	Negros Oriental	2,897.34
Bataan	10,327.58	Nueva Ecija	4,523.18
Batangas	4,058.74	Nueva Vizcaya	128.65
Bohol	2,137.91	Palawan	2,503.38
Bulacan	4,833.33	Pampanga	693.80
Cagayan	15,713.53	Pangasinan	6,047.36
Capiz	2,622.30	Rizal	2,792.89
Cavite	328.70	Samar	4,676.33
Cebu	2,609.97	Sorsogon	30,438.51
Cotabato	3,133.92	Sulu	1,164.42
Davao	4,073.55	Surigao	1,333.65
Ilocos Norte	1,191.03	Tarlac	1,078.58
Ilocos Sur	3,385.01	Tayabas	20,787.65
Iloilo	18,038.42	Zambales	2,668.79
Isabela	6,397.94	Zamboanga	48,219.93
Laguna	2,306.77		
La Union	290.69	Total charges	451,602.33
Lanao	1,588.58	Total fines and penalties	42,845.32
Leyte	10,457.90		
Manila	211,603.63	Grand total	494,447.65
Mindoro	4,853.48		

The above list shows the places where the forest charges were collected and not always where the products were gathered. This accounts for the large receipts shown by the principal market centers.

TABLE NO. 5.—*Timber licenses in force during the fiscal year 1916 (January 1 to December 31, 1916).*

Provinces.	Commercial licenses.					Gratuitous licenses.				
	For less than 100 cubic meters.	For 100 cubic meters and less than 1,000 cubic meters.	For 1,000 cubic meters and over.	License agreements.	Total commercial licenses.	For personal use.		For public work; second and lower group.	Miner's gratuitous licenses.	Total.
						In communal forests.	Outside communal forests.			
Albay	3	22	6	------	31	12	7	------	------	19
Ambos Camarines	30	57	7	1	95	13	10	2	20	45
Antique	7	1	------	------	8	------	------	------	------	------
Bataan	6	22	14	1	43	1	------	------	------	1
Batangas	7	3	1	------	11	------	2	------	------	2
Bohol	8	3	------	------	11	15	60	7	------	82
Bulacan	1	8	------	------	9	------	4	2	8	14
Cagayan	15	71	3	------	89	58	97	5	------	160
Capiz	43	11	1	------	55	14	22	11	------	47
Cebu	16	9	------	------	25	21	29	1	------	51
Ilocos Norte	48	12	------	------	60	26	------	1	------	27
Ilocos Sur	47	29	------	------	76	19	44	4	------	67
Iloilo	22	11	------	------	33	1	------	1	------	2
Isabela	8	46	------	------	54	49	------	2	------	51
Laguna	25	23	2	------	50	------	26	------	------	26
La Union	3	4	------	------	7	9	------	------	------	9
Leyte	45	52	3	------	100	8	319	8	------	335
Mindoro	5	49	5	------	59	------	35	4	------	39
Misamis	14	6	2	1	23	25	74	1	------	100
Mindanao and Sulu	70	30	22	2	124	24	199	11	------	234
Mountain Province	68	7	4	2	81	2	14	5	4	25
Nueva Ecija	20	23	------	------	43	24	33	------	------	57
Nueva Vizcaya	5	------	------	------	5	1	12	1	------	14
Negros Occidental	26	43	1	2	72	5	22	1	------	28
Negros Oriental	8	13	------	------	21	2	26	1	------	29
Palawan	8	12	23	------	43	------	47	4	------	51
Pampanga	3	4	------	------	7	------	------	------	------	------
Pangasinan	41	41	------	------	82	47	33	8	------	90
Rizal	11	8	------	------	19	1	2	------	------	3
Samar	60	24	2	------	86	71	32	------	------	103
Sorsogon	3	3	------	------	6	15	61	6	4	86
Surigao	21	3	2	------	26	28	85	3	2	118
Tarlac	7	3	------	------	10	------	65	2	------	67
Tayabas	19	81	8	1	109	17	9	2	------	28
Zambales	18	7	3	------	28	25	------	2	7	34
All provinces	------	------	------	------	------	------	------	1	------	1
Total	741	741	109	10	1,601	533	1,371	96	45	2,045

NOTE.—There was no license issued in the provinces of Batanes and Cavite.

In Cagayan and Isabela 2,123 licenses were issued for building tobacco curing houses. The timber authorized to be cut under these licenses amounts to 15,600 cubic meters of first and 34,500 cubic meters of lower group timber.

TABLE No. 6.—*Report of the utilization of forest products from public forests of the Philippine Islands during the fiscal year 1916 (January 1 to December 31, 1916).*

Provinces.	Timber.					Firewood.		Charcoal.	Dyewood.	Tan bark.	Dyebark.	Wood-oils.
	Group.				Total.	Class.						
	First.	Second.	Third.	Fourth.		First.	Second.					
	C. meters.	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*Kilos.*	*Kilos.*	*Kilos.*	*Liters.*
Albay	719	630	778	1,882	4,009	4,245	1,515	11		9,979	300	216
Ambos Camarines	2,307	2,404	6,335	1,705	12,751	13,204	12,404			11,980	4,400	
Antique	4	9	2	156	171		55					
Bataan	7	3,204	33,288	10,485	46,984	2,484	4,134	361		801		
Batangas	130	24	3	82	239	3	1,514	3		97,426		
Bohol	221	12	20	500	753	3,587	2,945	6		8,048		100
Bulacan	58	176	148	5,338	5,720	222	119	410		3,084		
Cagayan	4,636	899	1,275	2,417	9,227	19	3,903			11,450		100
Capiz	38	50	771	3,268	4,127	3,975	5,467	60				6,017
Cavite							2,362	76		14,667		
Cebu	71	30	28	221	350	109	581	5	867	13,193		
Ilocos Norte	220	135	97	209	661	213	137					
Ilocos Sur	637	629	276	309	1,851	162	1,364			187	207	
Iloilo	81	30	65	551	727	3,839	26,385	33	2,377,309	197,635		
Isabela	1,354	668	464	370	2,856		111					
Laguna	3	113	113	971	1,200		2,415	67		27,176	1,650	
La Union	66	20	3	36	125		13					
Leyte	901	577	1,435	3,334	6,247	1,679	1,017	7		900		35,964
Mindanao and Sulu:												
Agusan	846	54	14	66	980	95				8		
Bukidnon												
Cotabato	3,171	3,097	1,379	1,693	9,340	298	16,653					
Davao	28	21		26	75	278	504			300		
Lanao	282	1,536	9,777	27,366	38,961		700					
Sulu	1,015	592	7	13	1,627	1,008				113,435		
Zamboanga	11,662	4,683	7,949	20,961	45,245	2,488	571	27		414,690		
Mindoro	1,568	3,354	123	7,942	12,987	3,048	563	25		138,851	33,546	
Misamis	607	299	263	1,160	2,329	47	204			1,842	435	
Mountain	213	97	30	7,185	7,523		12,775					
Negros Occidental	1,004	602	18,889	55,862	76,357	16,186	26,538			696	14	1,563
Negros Oriental	270	314	199	253	1,036	25	6,440			1,861		16,624
Nueva Ecija	714	245	71	264	1,294		364	30		7,625		
Nueva Vizcaya	156	289	27		472		317					
Palawan	10,444	2,984		26	13,454	414	54			91,152	31,389	306
Pampanga	7	21	115	289	402	498	2,279	165		3		
Pangasinan	1,301	823	206	1,304	3,634	2,054	1,508	26		34,895		
Rizal	38	11	67	813	929	276	10,873	647		8,959	2,316	
Samar	407	287	509	628	1,831	1,474	223		3,290	141,710		1,905

TABLE No. 6.—*Report of the utilization of forest products from public forests of the Philippine Islands during the fiscal year 1916 (January 1 to December 31, 1916)*—Continued.

Province.	Timber.					Firewood.		Charcoal.	Dyewood.	Tan bark.	Dyebark.	Wood-oils.
	Group.				Total.	Class.						
	First.	Second.	Third.	Fourth.		First.	Second.					
	C. meters.	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*Kilos.*	*Kilos.*	*Kilos.*	*Liters.*
Sorsogon	5,303	2,656	528	3,174	11,661	16,228	29,939	49		29,768	18,800	558
Surigao	334	30	21	102	487	229				84,339		
Tarlac	95	55	17	30	197		96	52		5,078		
Tayabas	3,486	1,265	3,390	3,232	11,373	18,233	17,338	37		70,286		
Zambales	250	66	746	179	1,241	1,236	100	136		1,662		
Total	54,654	32,991	89,428	164,372	341,445	97,856	194,480	2,233	2,381,466	1,543,686	93,057	63,353

Provinces.	Gum mastic.	Gum elemi.	Gutta-percha.	Split rattan.	Unsplit rattan.		Diliman.	Stone.	Lime-stone.	Gogo.	Salago bark.
					More than 2 cm. in diameter.	2 cm. in diameter or less.					
	Kilos.	*Kilos.*	*Kilos.*	*Kilos.*	*L. meters.*	*L. meters.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
Albay		150		79,234							
Ambos Camarines	123,968	3,998		545,704	177,940	1,740,909	590				
Antique				4,076			3,241				
Bataan	165			94,635	54,460	581,018	1,610			7,853	
Batangas				35						23,911	
Bohol				1			765			6	
Bulacan	324			21,223	4,575	5,663				88	6
Cagayan				280,773	21,607	91,696	2,142				
Capiz	14,736			1,522							
Cavite										853	
Cebu				655			2,225				
Ilocos Norte				800		313			45,780	18	
Ilocos Sur				18,245	17,200			59,387	85,180		
Iloilo				1,541			2,813			124	
Isabela				2,000	39,340	221,400					
Laguna				39,292	5,280	30,200	3,635			308	
La Union									3,000		
Leyte				22,346	8,000	12,700	2,449	45		399	

Provinces.	Gum mastic.	Gum elemi.	Gutta-percha.	Split rattan.	Unsplit rattan.		Diliman.	Stone.	Lime-stone.	Gogo.	Salago bark.
					More than 2 cm. in diameter.	2 cm. in diameter or less.					
	Kilos.	*Kilos.*	*Kilos.*	*Kilos.*	*L. meters.*	*L. meters.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
Mindanao and Sulu:											
Agusan				53,435							
Bukidnon				13,811							
Cotabato			8,975								
Davao	629,535			1,032		135,900					
Lanao	7,090		4,905	180							
Sulu				710							
Zamboanga	116,474		5,081	8,079	1,290	12,720					
Mindoro				42,124	4,396	42,550	13,479			732	
Misamis	8,019			42,003			549				
Mountain				47,468							
Negros Occidental	200	30		188,634			4,316			2,540	
Negros Oriental			80	106,125			5,457			1,940	
Nueva Ecija				27,004	59,660	3,500	280			64,912	
Nueva Vizcaya											
Palawan	141,210	250		117,238	214,560	430,235				26,545	
Pampanga				4,400	6,500	56,700					
Pangasinan	539			2,546		76,922				1,101	
Rizal				46,927	3,975	3,625	676			4,955	
Samar	335			126,809			1,799			735	
Sorsogon	902	4,715		723,147	39,375		7,450			988	
Surigao				43,075		99					
Tarlac				2,486		10,160	38			11,048	
Tayabas	45,951	242,514	36	393,908	1,136,521	16,483,547	6,614			335	
Zambales				8,868	90,000	1,190,665				7,933	
Total	1,089,448	251,657	19,077	3,112,126	1,884,679	20,930,522	60,428	59,432	133,960	157,324	6

TABLE No. 6b.—*Report of the utilization of forest products from registered private woodlands during fiscal year 1916 (January 1 to December 31, 1916).*

Provinces.	Group.				Fire-wood.	Charcoal.	Tan bark.	Gogo.	White earth.	Dye bark.	Rattan.		Diliman.
	First.	Second.	Third.	Fourth.							Kilos.	Linear measure.	
	C. meters.	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*C. meters.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*			*Kilos.*
Albay	17.81	38.72	91.38	132.55									
Bataan				6.99	1,066								1,014
Batangas					6,219		337						
Bulacan					6,239								
Capiz	4.54												
Cavite				52.50	1,212	862	10						
Ilocos Norte		6.17	27.05	8.30									
Iloilo					1,768								
Isabela	24.54	15.12		34.28									
Laguna			4.17	174.52	3,389	643	1,890		52,559				
Mindoro	58.00	8.28		5.20									
Negros Occidental	149.12	44.11	304.72	562.53	6,997			51			527		140
Nueva Ecija	107.41	51.83	16.14	111.94	236								
Pampanga		1.12	19.35	447.69	43,599	124							
Rizal	43.29				7,692	165				8,505			
Tarlac	.89	2.26			6,011	21					1,660	422,097	
Total	405.60	167.61	462.81	1,536.50	84,428	1,815	2,237	51	52,559	8,505	2,187	422,097	1,154

TABLE No. 7.—*Minor product licenses in force during the fiscal year 1916 (January 1 to December 31, 1916).*

Provinces.	Firewood.	Charcoal.	Dyewood.	Tan bark and dye bark.	Wood-oils.	Almaciga, resins and others.	Guttapercha.	Bejuco and diliman.	Gogo.	Others.	Total.
Albay	26	------	------	5	------	1	------	18	------	1	51
Ambos Camarines	57	2	------	4	------	17	------	117	1	------	198
Antique	------	------	------	------	------	------	------	11	------	------	11
Bataan	20	7	------	------	------	4	------	30	5	------	66
Batangas	7	------	------	------	------	------	------	1	------	1	9
Bohol	13	1	------	------	------	------	------	------	------	------	14
Bulacan	4	10	------	------	------	1	------	16	1	------	32
Cagayan	36	------	------	5	1	1	------	54	------	------	97
Capiz	38	4	------	------	3	7	------	5	------	3	60
Cavite	6	------	------	------	------	------	------	------	------	------	6
Cebu	8	4	------	------	------	------	------	------	------	1	13
Ilocos Norte	7	------	------	------	------	------	------	2	------	3	12
Ilocos Sur	25	------	------	2	------	------	------	17	------	18	62
Iloilo	72	5	18	------	------	2	------	9	1	10	117
Isabela	6	------	------	------	------	------	------	15	------	------	21
Laguna	5	------	------	------	------	------	------	13	2	10	30
La Union	2	------	------	------	------	------	------	------	------	------	2
Leyte	39	2	------	------	10	1	------	30	------	10	92
Mindoro	27	------	------	17	------	------	------	39	7	1	91
Misamis	4	------	------	2	------	7	6	17	------	------	36
Mindanao and Sulu	95	14	1	28	1	34	25	49	1	------	248
Mountain Province	13	------	------	------	------	1	------	3	------	2	19
Nueva Ecija	3	------	------	------	------	------	------	23	27	------	53
Nueva Vizcaya	4	------	------	------	------	------	------	------	------	------	4
Occidental Negros	87	------	------	1	9	7	------	172	7	47	330
Oriental Negros	11	------	------	------	6	1	------	41	------	11	70
Palawan	42	------	1	53	6	30	------	52	7	------	191
Pampanga	3	2	------	------	------	------	------	1	------	------	6
Pangasinan	17	------	3	5	------	1	------	5	2	------	33
Rizal	26	3	1	3	------	------	------	18	6	------	57
Samar	24	------	------	------	2	2	------	8	------	1	37
Sorsogon	61	3	------	6	1	5	------	81	6	1	164
Surigao	11	------	------	3	2	------	------	29	------	------	45
Tarlac	1	------	------	------	------	1	------	3	3	------	8
Tayabas	67	4	------	16	------	36	------	77	1	4	205
Zambales	10	4	------	2	------	5	------	20	5	------	46
Total	877	65	24	152	41	164	31	976	82	124	2,536

NOTE.—There was no license issued in the Province of Batanes.

TABLE No. 8.—*Statement showing the quantity and value of wood and manufactures of wood exported from the Philippine Islands during the fiscal year 1916 (January 1 to December 31, 1916).*

	Quantity.	Value.
Timber:		
United States ..... cubic meters	771	₱32,832
Hawaii ..... do		50
China ..... do	190	9,484
Hongkong ..... do	413	6,474
Australasia ..... do	4	148
Total	1,378	48,988
Lumber:		
United States ..... do	14,109	626,354
Guam ..... do	11	465
France ..... do	3	200
China ..... do	15,270	254,828
British East Indies ..... do	112	4,916
French East Indies ..... do		10
Hongkong ..... do	9,255	92,949
Japan ..... do	15	1,520
Australasia ..... do	1	46
Total	38,776	981,288
Manufactured lumber (furniture, etc.):		
United States		28,235
Hawaii		5,357
Guam		72
Italy		20
Spain		170
Canada		66
China		232
British East Indies		225
Hongkong		424
Japan		520
Total		35,321
All other wood:		
United States		94,136
Hawaii		53
Guam		1,163
United Kingdom		184
Spain		1,305
Canada		38
China		1,624
British East Indies		1,993
French East Indies		210
Hongkong		10,945
Japan		7,174
Australasia		50
Total		[a] 108,875
Total		1,174,472

1 cubic meter = 424 board-feet.

[a] Of this amount, ₱82,100 is the value of rattan exported.

TABLE NO. 9.—*Statement showing the quantity and value of gums and resins exported from the Philippine Islands during the fiscal year 1916 (January 1 to December 31, 1916).*

	Kilos.	Value.
Copal:		
United States	640,564	₱138,845
United Kingdom	81,004	12,674
France	30,000	4,500
Russia	2,815	842
Spain	38,621	6,792
British East Indies	328,600	42,131
Japan	22,334	5,809
Total	1,143,938	211,593
Elemi:		
United States	80,357	36,719
United Kingdom	12,225	4,500
France	600	120
Italy	3,545	1,772
Russia	2,200	660
Spain	4,691	1,913
Hongkong	573	148
Japan	120	20
Total	104,311	45,852
Gutta-percha:		
United States	9,076	10,482
United Kingdom	34	20
British East Indies	20,852	12,396
Total	29,962	22,898
All other:		
United States	13,026	32,151
British East Indies	230	1,568
Total	13,256	33,719
Total	1,291,467	314,062

TABLE NO. 10.—*Statement showing the quantity and value of wood and manufactures of wood imported into the Philippine Islands during the fiscal year 1916 (January 1 to December 31, 1916).*

	Cubic meters.	Value.
Ties for railways	None	None
Timber:		
United States	417	₱13,387
United Kingdom	1	469
Germany	66	3,279
China	5	62
French East Indies	6	965
Total	495	18,162
Lumber:		
United States	11,311	284,542
Netherlands		26,457
China	88	3,364
German China	23	80
British East Indies	246	4,847
French East Indies	98	614
Total	11,766	319,904
Furniture:		
United States		45,385
United Kingdom		1,311
Austria-Hungary		1,187
France		828
Germany		82
Spain		1,565
Switzerland		252
China		13,291
British East Indies		369
Japan		8,501
Dutch East Indies		20
French East Indies		6
Korea		45
Total		72,842
All other:		
United States		91,219
United Kingdom		4,753
France		1,734
Germany		1,936
Italy		23
Spain		2,178
Switzerland		658
China		48,752
German China		60
British East Indies		284
Japan		53,823
Australasia		8
Dutch East Indies		139
French East Indies		394
Korea		91
Guam		34
Total		206,088
Total		616,996

TABLE NO. 11.—*Statement of appropriations and expenditures, Bureau of Forestry, January 1 to December 31, 1916.*

Appropriation:		
Act, No. 2540	₱308,205.20	
Emergency Board Resolution No. 26	3,000.00	
Total		₱311,205.20
Expenditures:		
Salaries and wages	201,176.77	
Furniture and equipment	4,990.38	
Traveling expenses of personnel	34,401.64	
Rental of buildings and grounds	2,371.81	
Freight, express, and delivery service	1,369.11	
Printing and binding reports, documents, and publications	2,699.95	
Postal, telegraph, and cable service	4,491.57	
Illumination and power service	1,403.83	
Plant and equipment repair service	799.14	
Contingent service	1,363.36	
Consumption of supplies and materials	13,494.51	
Contributions and gratuities	13,722.93	
Total expenditures		282,285.00
Balance		28,920.20
Appropriation for Cebu Reforestation (Act 2649)		10,000.00
Expenditures:		
Salaries and wages	1,266.79	
Traveling expenses of personnel	1,360.82	
Freight, express, and delivery service	44.73	
Postal, telegraph, and cable service	15.64	
Contingent service	2.50	
Consumption of supplies and materials	649.86	
Furniture and equipment	82.75	
Total expenditures		3,423.09
Balance		6,576.91
Appropriation for Forest School building (Act 2494):		
Balance on January 1, 1916	33.96	
Act No. 2583	18,000.00	
Total		18,033.96
Total expenditures		11,964.31
Balance		6,069.65
Appropriation for Agusan reconnaissance (Act 2521):		
Balance on January 1, 1916		284.85
Expenditures		
Balance		284.85

Statement of Bureau of Forestry appropriations, expenditures, and revenues for fiscal year, 1916.

Appropriations		₱321,205.20
Revenue		494,447.65
Expenditures		285,708.09
Surplus		208,739.56
Percentage of expenditures to revenue	per cent	58

Philippine Islands. Bureau of forestry

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1917



ARTHUR F. FISCHER
Director of Forestry

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY.

MANILA, *February 25, 1918.*

SIR: I have the honor to submit herewith the Annual Report of the Bureau of Forestry for the fiscal year 1917, covering the period from January 1 to December 31, 1917.

LEGISLATION.

A number of bills were introduced in both branches of the Legislature which directly or indirectly touched upon forestry matters.

Senate Bill No. 136 contained provisions for the protection of fruit trees found in forests. This bill failed to pass, but by inserting its provisions as one of the cutting rules of the timber licenses, it will be possible to protect fruit trees from destruction.

Senate Bill No. 137 provided for Government aid in the establishment of a sugar central for the production of sugar from the sap of nipa. There are large areas of nipa forest in the Philippines under the control of this Bureau.

House Bill No. 911 has been passed by both Houses and guarantees 6 per cent interest upon the capital invested in a mill to produce paper from Philippine products. The bulk of pulp making materials are under control of the Bureau of Forestry.

House Bill No. 1171 was passed appropriating ₱5,000 for the construction of forest stations which will be located at the several mills where scaling is being done. Ten thousand pesos were appropriated for the construction of a road from the College of Agriculture to the Forest School. This improvement is needed as the present road is almost impassable after prolonged rains.

House Bill No. 1197 amending Act No. 2613 contains one item of interest to the Bureau of Forestry. It extends the time in which tobacco growers can secure free timber for the construction of tobacco curing houses.

House Bill No. 869 failed to pass. This bill proposed to exempt from forest charges Sibucao (Sapan wood) and firewood secured from unregistered private lands.

PERSONNEL.

Several changes were made in the technical personnel of the Bureau this past year, due to much greater opportunities being offered to technical men by large companies and foreign governments bidding for their services. The most important resignations were those of the chief of what was formerly the division of forest management, one district forester, the chief of the division of administration, one field assistant, and the chief of the division of investigation and professor in charge of the Forest School, all of whom were Americans and exceedingly valuable men with years of experience in the Philippines. It was thought that the exodus of these responsible technical employees would impair the efficiency of the Bureau, but to counteract the possible embarrassment, other arrangements were made to accomplish the work. The first one mentioned above resigned to enter the employ of a private company in China at an increased salary and is doing much toward creating a market for Philippine woods in China. The second, who was in charge of the Forest School and division of investigation during the vacation of the chief, accepted a position with a large rubber company in Sumatra at a much better salary and greater privileges; credit is due him for inaugurating and outlining the work of reforestation for the Bureau, part of which was considered in last year's report. The chief of the division of administration, initiator of the Filipinization of clerical positions in the Bureau and reorganizer of the entire office procedure, accounting, etc., not only increasing efficiency but resulting in proportionately large economy, accepted a position with a private concern in the United States at double his salary. The fourth, considered by the Bureau the best field man it ever had along lumbering lines, has gone into business for himself with assurances that he will make at least four time his salary. The fifth, chief of the division of investigation and professor in charge of the Forest School, a man of wide reputation along scientific forestry lines, to whom the Bureau owes much for its scientific data, and with more than eleven years service in the Philippines, took advantage of the Retirement Act and accepted a position as forest research officer for the Federated Malay States, with much better privileges than he was receiving in the Bureau.

Six rangers resigned during the year, one of whom accepted a better position in the Borneo Forest Service, and another a better paying position with the Kolambugan Lumber and Development Company; the others wished to continue their education. One ranger was dropped for unsatisfactory service and another

for overstaying his leave. Another ranger transferred to the Bureau of Education. The following appointments were made during the year: twenty-one rangers graduated from the Forest School; 8 clerks; 2 messengers; 1 American forester reinstated and 1 lumber inspector. Some of the new clerks and messengers were to fill vacancies due to the changes in the office caused by retiring employees. The permanent force on January 1, 1918, consisted of: one Director, 1 lumber inspector, 7 foresters, 1 instructor in forestry, 1 wood expert, 1 field assistant, 2 assistant foresters, 118 rangers, 5 draftsmen, 31 clerks, and 1 messenger, besides the following employed on a temporary status: one nurseryman, 1 draftsman, 11 laborers, 1 carpenter, 1 varnisher, 38 guards, 2 watchmen, 2 janitors, 1 chauffeur, 1 launch engineer, 1 launch patron, 1 launch sailor, 1 telephone operator, and 2 messengers, making a total of 233 employees.

ORGANIZATION.

It has been found necessary to make a general revision of the divisions of the Bureau of Forestry and, owing to the use of the word "Administration" throughout the Government service to indicate the work of the office of the chief clerk, the term forest management was adopted for the former division of administration. The land classification work of the Bureau has constantly increased in volume and importance and all such work has been turned over to the division of forest lands and maps, while all the large twenty-year license agreements and sawmills and the work in connection therewith were placed under the division of sawmills and utilization, taking over practically all the work of the former division of forest management. No material changes were made in the division of investigation.

The undersigned is pleased to state that these changes have resulted in clear-cut lines of work and have done away with friction, duplication of work, and divided responsibility.

EFFICIENCY.

The field work has been done as in the past, with the exception that special corps of rangers are being built up for specialized work, such as reconnaissance crews attached to the division of forest lands and maps. These men are trained to do special work in relation to reconnaissances, forest zones, reserves, etc., where land questions are always included to a greater or less extent. A body of investigative rangers was partially formed, but due to lack of personnel for the district ranger force, this crew was disbanded for the time being.

As the work of the Bureau along all lines is increasing very

greatly and becoming year by year more detailed, while the lack of sufficient field personnel is still felt, methods had to be devised to keep up the work without loss of efficiency and promptness; this has practically been solved by a revision of forms and by substituting forms for the monthly reports and in general by doing away with as much red tape as present conditions would allow.

All cases which involved special work are arranged in the central office and the rangers instructed accordingly. Responsibility for efficiency and economy rests with the division of forest management more from precedent than from the importance of the work, leaving the chiefs of the other divisions free for other work.

Transfers of rangers, disciplinary measures, and recommendations for promotions are acted upon by a "Personnel Committee" composed of the chiefs of divisions and the inspectors in the Manila office.

FORESTS AND THE MINING INDUSTRY.

With the increase in the development of mining, a situation arose in which the Bureau had to take decisive action so as to make timber available for legitimate mining operators who were being handicapped by being forced to pay beyond reason for timber, or by being placed in a position of having to buy claims with standing timber to prevent shutting down for lack of it. The situation as a whole is not serious at the present or discouraging for the future, but is rather the natural result of the first stages of development of new mining districts and can easily be handled by the initiation and enforcement of a just and legal forest policy. The policy of the Bureau has been very liberal toward the mining industry, but this policy was based on the good faith of the prospector and miner. The mining law not being enforced, assessment work not being done and relocation practised year after year, it is obvious that the forest policy in regard to mining could not be what it should have been, because of lack of information in the hands of the Government and the entities having charge of mining as to the condition and status of claims for which miner's timber licensees were requested. It was obvious that the first necessity, before anything definite could be done, was information and, for this purpose, parties were sent out to the various mining regions to make reconnaissances, mapping claims, the vegetation and stands of timber in the vicinity.

In the Benguet district, the demand for timber was keenly felt, which caused practically all of the accessible forests to be

staked as mining claims for the sake of the timber which was held at constantly increasing prices as the timber demand increased. A majority of the claimants were actuated by no other motive than to protect their legitimate mining interests by attempting to secure for themselves a supply of timber sufficient to develop their property, but there are a few notable cases where the purpose is not so justifiable, as it was very evident that the claims were staked for timber only, with the intention of profiting thereby by disposing of mining timbers to active miners and prospectors who had been debarred from the public forests by the wholesale blanketing of the surrounding country with so-called mining claims.

As soon as enough information was at hand, the undersigned immediately instituted much stricter control over all timber in mining districts on unpatented claims and surrounding forest lands, keeping in mind and aiding as much as possible the mining industry, with special reference to maintaining a future timber supply for mining development and domestic requirements, as well as keeping in mind the watersheds, to prevent floods in the wet season and diminished water supply in the dry season.

Due to the Bureau not being able, as mentioned above, to obtain the necessary information on mining claims from the other Government entities having charge of them, for the proper control of the issuance of licenses to miners, and the field personnel not having the necessary technical education or authority, it was indispensable to devise means of obtaining the needed information. The undersigned therefore visited the mining region around Baguio, studied the situation and conferred with the miners. As a result, the Benguet Miners' Association was reorganized and now, whenever any person applies for a license within the mineral region, his application is informally referred to the Association for comment and recommendation. As a committee of the Association goes into each case very thoroughly, the Central Office, knowing the view point of the industry as a whole, can act intelligently on each case. During the year, the Benguet Miners' Association has loyally coöperated with the Bureau of Forestry in protecting and using conservatively the existing forest. The miners are also coöperating in reforesting the stripped watershed.

The Paracale field is practically all placer claims and the dredges use thousands of cubic meters of firewood every year. The claims that are being dredged do not furnish all this firewood and it will be necessary to use the highland forests more extesively than in the past. Field parties of the Bureau have

covered this region and have gathered information which will allow the intelligent administration of the forests for the industry. The Aroroy field in Masbate has also been covered by field parties of this Bureau and like information gathered. Field parties have likewise studied and reserved areas of timber in and about the most promising coal deposits to assure timber for future development.

On the whole, the relations of the miners with the Bureau of Forestry have been cordial and the only causes for friction have been due to misunderstanding the jurisdiction of the Bureau of Forestry. An effort will be made to bring the new Forest Regulations to the attention of every miner.

REFORESTATION.

In several districts considerable interest has been aroused in reforestation.

In those regions in which no timber is found, more particularly the Ilocos coast and southern Zambales, the people are taking an active interest in reforestation. Several municipal presidents in La Union, Ilocos Norte, and Ilocos Sur have requested help in establishing forest plantations or in planting timber trees in their communal forests. In Zambales, the residents of the district from San Antonio to San Felipe are obliged to go from 10 to 15 kilometers for firewood and the municipal officials are ready to coöperate in planting cogon hills near their towns with ipil-ipil seed. Some seed has already been secured, but owing to there being no fund for this purpose only such work was undertaken as means permitted.

Additional data has been secured regarding ipil-ipil and the Bureau of Forestry is now in a position to recommend the planting of ipil-ipil by farmers who are obliged through necessity to make caiñgins. It is hoped that the non-Christian tribes who now make clearings in valuable forests can be induced to confine their operations to ipil-ipil areas. A regular rotation system is being followed by farmers in Laguna, Panay, and Cebu, who cultivate successive patches of ipil-ipil, and there is no reason why others who have no work animals cannot do the same.

In Benguet, owing to lack of funds, no extensive work has been undertaken although, in coöperation with miners, 14,000 shrubs were set out at the head of Antamok Creek, Baguio, for the purpose of protecting the watershed and killing grass. If grass fires can be prevented there will soon be an abundant crop of pine seedlings springing up. However, unless energetic measures are taken soon, there will be a scarcity of timber in certain sections of Benguet.

The report of 1915 contained a detailed account regarding the reforestation work being carried on at Cebu. This work has been continued with success, 971 hectares having been planted during this past year. There was some opposition from certain squatters who believed that they owned the land, although it was a friar land estate, but when they realized that they had no right to the same, they moved to other regions or helped in the planting.

Several individuals have taken an interest in reforestation work, notably two farmers in western Pangasinan who furnished laborers to replant a deforested valley from which they had formerly secured water to irrigate their fields. Three sugar cane planters in Negros have also furnished laborers to plant firewood on cogon hills in order to secure enough fuel for their cane mills.

DIVISION OF FOREST MANAGEMENT.

DUTIES.

Upon the reorganization of the divisions of the Bureau, the former division of administration was renamed the division of forest management. The chief of this division is a forester with seven years experience in Philippine forestry work and he is charged with the general supervision of all the field men, the protection of the public forests, and the sale of forest products. All matters involving the disposition of land or surveying have been transferred to the division of forest lands and maps.

By this arrangement, the chief of the division of forest management has more time for special features of his work which demand solution if the forests are to remain an asset of the Philippine Islands.

NEW FOREST DISTRICTS.

Two new forest districts were established in 1917, thus making fourteen in all. The district serves as an administrative unit and whenever the development of roads or improvements in mail service make it necessary, the provinces and islands comprising the districts are rearranged.

District No. 12, Mindoro Island, was divided into two subdistricts, each reporting dircetly to Manila, because there was no regular steamship service between the northern and southern end of the island.

District No. 13 comprises Cavite and Rizal Provinces with its headquarters at Manila. The need of such a district had been felt for some time and the results have justified its establishment. Not only do the men assigned to this district perform

their usual duties, but they are available for special service. Another advantage is that local licensees who, in the past, always came to Manila to transact their business can do so directly with the district force.

District No. 14. In forming this district, advantage was taken of the steamship lines radiating from Cebu. Nearly all the territory dependent upon that port as a distributing center has been included in this district. It contains the following provinces: Cebu, Oriental Negros, Bohol, and Agusan.

INSPECTION.

More district headquarters and forest stations were inspected during 1917 than in the preceding year. The undersigned visited districts 2, 3, 4, 5, 7, 8, and 10 and districts 6 and 11 were inspected by men from the Manila Office.

The work of inspection will be continued as the special problems of each station can be solved to better advantage by a conference than by correspondence. Another advantage is that the Central Office is in more intimate touch with the field force and can thus secure greater efficiency and better coöperation.

SUPERVISION.

To supplement the work of inspection, an experienced ranger examines all license-inspection reports, diaries, expense accounts, and working programs and makes the proper entries on cards. These cards are ruled into columns, thus providing space for the different lines of work performed by rangers. The efficiency of the field force can thus be kept up, but certain shortcomings have developed which it is hoped will be solved by the use of a revised monthly report which shows both the amount of work performed daily and that still pending at the end of the month.

LICENSES.

The Bureau of Forestry authorizes responsible persons to cut specified forest products in a definite area under such restrictions as may be necessary to perpetuate the supply of forest products.

The licenses and permits now in use are: License agreements for a term of not more than twenty years, ordinary licenses, special use permits, miners' licenses, gratuitous licenses, and tobacco curing house licenses.

No fees are charged for these papers and all forest charges are fixed by law or, in the case of minor products such as rattan, bark and resins, by the Director of Forestry and Collector of Internal Revenue and are then published in the Official Gazette.

The license agreements are contracts whereby the license is authorized to operate for a term of years. Reforestation or

conservative management of the forests is one of the requirements if the forest is not on agricultural land.

The gratuitous licenses are issued to individuals who need first-group timber for erecting a "strong material" house, that is, one having wooden walls and floors as distinguished from one made of bamboo or nipa. Gratuitous licenses are issued to public officials for securing timber for public works. Miners also receive gratuitous licenses to cut timber upon their claims.

A miner's license authorizes a miner to secure public timber for development work at half the ordinary rates.

Special-use permits authorize the use of public forests or the securing of forest products in accordance with the terms stated in each permit. The greatest demand for these permits is from those who intend to make ponds in tidal swamps for raising fish.

The tobacco curing house license is issued only to tobacco growers who want free timber in order to build a properly designed tobacco curing house. This work is under the close supervision of inspectors of the Bureaus of Agriculture and Internal Revenue, who are also authorized by the Director of Forestry to issue these licenses.

LICENSE STATISTICS.

Ordinary timber licenses increased more than 300, there being a total of 1,906 in force. This does not include those which were returned or canceled. There was, however, a decrease of 262 in the number of gratuitous timber licenses issued, the total being only 1,783.

In the minor forest products, 3,473 licenses were issued, an increase of 937. The greater part of this increase was divided, almost equally, between firewood and rattan, these two forest products being in such a demand that they commanded almost double the prices ruling in ordinary years.

Tables Nos. 5 and 7 in the appendix show in detail the licenses issued during the year.

OFFENSES OF LICENSES.

The offenses committed by licenses can be divided into two classes, namely, those acts which involve loss of revenue to the government and those which are a disregard of the instructions intended to perpetuate the forest resources.

Under the first heading comes selling forest products before forest charges have been paid and also the securing of forest products without license. Only close supervision will prevent the sale of products and if a licensee fails to improve his methods, the license is not renewed or is canceled.

The disregard of cutting rules is due to an inherent fault of the short term license system and to the lack of supervision by the licensee over the operations in the forest. A license is issued for only a year and, therefore, the licensee does not have the same interest in it as if he had a long term license. The lack of supervision by the licensee is most noticable in the case of those who merely secure a license and then collect fees from these who want to cut timber. The licenses of such offenders are promptly canceled when over there is sufficient evidence to warrant it.

Another form of violation is frequent, namely, the cutting of small first-group trees for special purposes. There are a number of durable trees in the lower groups which will serve equally well, but licensees persistently cut small trees as they are readily salable, thus depleting the supply of growing first group timber.

The lack of responsibility of a licensee is shown most conspicuously in firewood operations, where the usual practice has been to make contracts with firewood cutters, who then cut whatever they please regardless of any prohibition that may have been made about cutting trees that are smaller than a specified diameter.

OFFENSES OF NONLICENSEES.

It is the nonlicensee who fells seed trees, cuts small timber, steals products secured by others and makes trouble for all legitimate forest users.

If an unauthorized person operates within the area of a licensee, the products so cut can be confiscated and delivered to the licensee. If he operates in an unoccupied public forest, he is comparatively safe, for, if his allegation that he is cutting for personal use fails to justify his operations, he merely pays double the ordinary charges.

FUTURE WORK.

During 1918 the tidal swamps will be put under systematic management as rapidly as they are surveyed. Other forests and forest products will also be studied in order to handle them conservatively. The production of gutta-percha, wood oil, gum copal and other resins, also rattan, palm products, and upland firewood need to be put under some form of management which will not put a premium on clear-cutting the forest.

If the funds permit, greater efforts will be made to coöperate with municipalities in planting firewood species on waste land.

CAIÑGIN DEFINITION.

The term "caiñgin" is used to designate a primitive form of agricultural operations involving forest destruction and usually temporary occupation of the cleared land.

REDUCTION IN NUMBERS.

The number of caiñgin cases reported shows a decrease and the number of successful prosecutions is much larger than was the case in 1916. The decrease in numbers is due to several factors. Bountiful crops in many parts of the Islands made it unnecessary for farmers to clear additional land. The publicity given by forest officers to the advantages of acquiring land under the homestead sections of the Public Land Act has tended to reduce the illegal occupation of public land. Another reason for there being fewer caiñgins is that definite areas of brush land were set apart and cleared under a general permit, thus giving the people an opportunity to raise food without destroying forests.

Caiñgin reported during the fiscal year 1917, January 1 to December 31, 1917.

Province.	Reported by—		Total.	Acted on.		Total.
	Forest officer.	Municipal president.		Convicted.	Acquitted.	
Abra						
Albay	78		78			
Ambos Camarines	63		63	22	2	24
Antique						
Bataan	8		8	8		8
Batanes						
Batangas						
Bohol	3		3			
Bulacan	21		21			
Cagayan	36		36	1		1
Capiz	29		29			
Cavite						
Cebu	13		13	2	2	4
Ilocos Norte	9	1	10			
Ilocos Sur	14		14			
Iloilo	1		1	7		7
Isabela	11		11			
Laguna	34		34	3	1	4
La Union						
Leyte	45	2	47	49	14	63
Mindoro	36		36			
Misamis						
Department of Mindanao and Sulu:						
Agusan	1		1			
Bukidnon						
Cotabato	1		1			
Davao						
Lanao						
Sulu						
Zamboanga	8		8	8	2	8
Mountain Province	8		8			
Nueva Ecija	19		19	6	6	13
Nueva Vizcaya	5		5	5		5
Occidental Negros	28		28	72		72
Oriental Negros	1		1			
Palawan						
Pampanga	2		2			
Pangasinan	17		17	2		2
Rizal						
Samar	22		22	36	18	54
Sorsogon	76		76	35	12	47
Surigao	8		8	31		31
Tarlac						
Tayabas	56		56	32	3	35
Zambales	9		9	4		4
Total	662	3	665	321	60	381

The reason more cases were successfully prosecuted was due to the greater experience of the rangers, as well as care in presenting the facts at the trial.

CAUSES FOR CAIÑGIN MAKING.

Caiñgins are made either through deliberate disregard for the law or because of dire necessity. The Bureau of Forestry has, from the first, recognized this distinction, as may be noted in the forest law, which provides that members of non-Christian tribes shall be warned for a first offense. Those who make caiñgins regardless of law and for the sole purpose of acquiring land usually have the support of influential persons in town who share in the crop and eventually claim the land.

The persons who make caiñgins through necessity are either non-Christians or else farmers who, through the lack of work animals, are forced to clear forest land in order to raise food.

THE CAIÑGIN MENACE.

The making of caiñgins cannot be called a development of the country as was the case in the United States, for in the vast majority of clearings only one or two crops are raised. After that, the presence of cogon grass (*Imperata exaltata*) with its matted roots makes further planting impossible unless the land is plowed. It is, therefore, obvious that a farmer without work animals must make another clearing. This has gone on for centuries, until now 40 per cent of the land area of the Philippines is covered with nonproductive cogon.

Persons who have made a caiñgin believe that they have secured a title to it when they have been prosecuted, for they continue to enlarge their clearing and thus present a very difficult problem as no law seem to be applicable to their case.

THE REMEDY FOR CAIÑGINS.

The only way to reduce the number of caiñgins made to acquire land is to continue the propaganda now being carried on by forest officiers. They emphasize the evils of forest destruction, explain the homestead system of acquiring land and, what is more, aid the homesteader in preparing his application. More stringent laws dealing with forest destruction and one punishing unlawful occupancy of public land would do much to discourage this practice.

As for the second class of caiñgin makers, the Bureau of Forestry has a remedy. As has already been explained under the topic "Reforestation," the clearing of thickets of ipil-ipil will permit habitual caiñgin makers to raise crops and gain a living without becoming law breakers.

FOREST DISTRICT REPORT.

Only the striking features of the work in each district are mentioned in the following summary, as the usual work of examining lands, inspecting forests, enduring hardships and the high cost of living are common to all districts.

District No. 1.—Lumbering as in the past, depended upon the ability of lincensees to market their output. These licensees who were near the coast or could secure cargo space were active. The provincial government mill in Nueva Vizcaya supplied local needs and also furnished timber for public works in Isabela.

Complaint was made by timber licensees that certain brokers in Manila are too liberal in discounting defects. One man in particular stated that 40 per cent of a shipment of sound Narra had been rejected for fancied defects. Others claimed that on an average, 30 per cent of each shipment is deducted by Manila buyers. This is a long standing abuse which can only be remedied by concerted action on the part of responsible lumbermen and the establishment of Government inspection in cases of dispute.

The price of baling rattan was nearly doubled; it was selling at ₱9 in December instead of at ₱5.50 as normally. Almaciga (gum copal) was exported for the first time and guano and red ochre deposits were being developed.

There was no appreciable change in the number of licenses issued. The amount of homestead work increased because of the addition of Nueva Vizcaya to the district.

The prosecution of caiñgin cases was very successful and the cases brought to trial shows an increase. Only three caiñgin permits were issued and two hundred other applicants for permits were induced to homestead the land.

Eight parcels of communal forests were located for different towns.

The forestry exhibit at the First Annual Tobacco Exposition of Isabela was most instructive and the first prize was received.

For better administration, two new forest stations were established, namely, at Tuguegarao and Echague, and four guards were employed who were instrumental in collecting forest charges amounting to over ₱3,000 on timber which had been cut without license.

District No. 2.—There has been practically no change in the number of lincenses in force. As for public land reports, 192 were pending due to a ranger having left the district in June and not being replaced. Many reports were received in November and December too late for inspection during the year.

The caiñgin situation was favorable. The majority of the clearings found were confined to alleged private land. The "Food Production Campaign" has resulted in an increased demand for caiñgin permits and to simplify the issuance of permits, clearings were authorized in restricted areas which were to be homesteaded or planted with ipil-ipil. The sawmill at Burgos was not operating during the year owing to the absence of its manager.

District No. 3.—The chief work of the district has been marking trees for various licensees and setting aside pasture areas for these grazing stock in order that indiscriminate grass fires within forest areas may be controlled.

The marking of trees is necessary, as otherwise no seed trees would be left. Further, unless there was some supervision, trees upon private property would be destroyed by irresponsible firewood cutters. By the leaving of seed trees and by the prevention of grass fires, a start has been made in restocking limited areas with pine seedlings. Unfortunately, a single grass fire will undo the work of several years, therefore reforestation by means of seed trees is slow.

Owing to the provision of the forest law which acquits non-Christians for the first offense of destroying trees, it was necessary to prosecute a number of Igorots under a municipal ordinance which forbids the cutting or damaging of trees within the limits of Baguio. The effect was beneficial, as the number of requests to mark trees increased.

The Benguet Miners' Association has coöperated loyally with the forest officers in managing forests in the vicinity of the mines.

Nursery work was carried on as in the past. Thousands of trees and shrubs were distributed or planted.

District No. 4.—There was a considerable increase in the cutting of timber due to two reasons, namely, to the demand which usually follows a bountiful harvest and also to the establishment of a shipyard at Bolinao, which affected licensees in western Pangasinan. About one hundred more licenses were issued in 1917 than in the previous year.

There is a great demand for firewood and it is very urgent that mangrove swamps be put under systematic management, as it has been found that the cutting rules designed for their protection are not sufficient to accomplish that purpose. A licensee may obey the instructions contained in his license, but the government does not derive any benefit from his doing so because other licensees or irresponsible firewood cutters invade his area and cut clean.

The "Food Campaign" has increased the number of homestead applications; 1,200 more applications were received during 1917 than in 1916. A great many of these homesteads required careful inspection due to their proximity to the forest.

Communal forests are not accomplishing the object for which they were established.

The number of caiñgin cases reported has fallen from 52 to 9. This is due to the coöperation of the licensees, who realize that their business is dependent on the existence of the forest. Moreover, persons who wish to make caiñgins are better informed regarding the law and they now apply for homesteads.

The changes of the district as announced last year have proven to be advantageous. Unfortunately, due to the lack of personnel, it has not been possible to maintain a ranger at Masinloc throughout the year. It has therefore been necessary to make long trips from Dagupan to the west coast of Zambales.

District No. 5.—The addition of southern Tayabas to the district has added more territory, but no new problems. The work of the previous years in dividing the forests into compartments suitable for the operations of small licensees is of great value to the district, as this system not only facilitates the granting of licenses, but it also shortens the trial notes which may be taken for other purposes, as there are a large number of known points throughout the district. The compartment system will be extended to southern Tayabas as rapidly as possible. In fact, the reconnaissance of this region, which is now in progress, is the beginning of this work.

Owing to the good prices obtained for abaca (Manila hemp), considerable building has been going on. The timber licensees are prosperous and three of the mills in the district have been doing a good business. The Tayabas Sawmill Company has been reorganized under the name of the Philippine Lumber Company and is now being operated by Filipino capital.

The "Food Production Campaign," here as well as elsewhere, has been seized upon as an excuse by certain individuals for making caiñgins.

The lack of personnel is strongly felt. Additional rangers and guards are needed in order to control the cutting of firewood, which at the present time is the chief forest industry of this district.

District No. 6.—The high prices obtained for abaca created a great rush of labor to the hemp plantations and, for this reason, many of the small licensees were obliged to reduce their operations. Licensees operating on the Pacific coast of this district have been seriously handicapped by lack of transportation. As

a result, the lumber dealers of Legaspi have had difficulty in meeting the local demand and their yards are usually empty.

The number of caiñgins made in the district has not decreased. The greatest difficulty about caiñgin making is among the hemp planters who make small clearings in the forests and then from year to year girdle the larger trees in the adjacent forest and thus extend their hemp plantation. As this is a gradual process and does not involve clearing of the land, the discovery of such clearing is exceedingly difficult, as a person's vision when going through a hemp region is limited.

The most important line of work to be undertaken during the year is the establishment of a forest zone around Mount Isarog in order to limit the hemp plantations, which are now extending up the slopes, and thus maintain the remaining forest for the protection of irrigation works in the surrounding country.

District No. 7.—Lumbering has been active throughout the district, as shown by the numerous requests from licensees for additional amounts of timber.

A violent flood for a time interrupted lumbering at Fabrica and Cadiz, but the chief obstacle met with by all licensees was the lack of shipping.

The fuel situation is a serious problem. Some mangrove swamps have been stripped of all firewood and therefore will not be in a productive condition for years to come. Careful management of the tidal swamps will prevent destruction, but it will not relieve the fuel shortage. As far as possible, the firewood licenses have been given to persons needing fuel and speculators have been eliminated whenever found.

The rangers coöperated with several sugar-cane planters in Negros who have planted ipil-ipil on abandoned land near their sugar mills. The ipil-ipil will not only furnish fuel, but will also enrich the soil which had become exhausted.

There have been many important cases in court over the registration of forest land in which the rangers successfully proved the validity of the Government's claim to the land.

District No. 8.—The mills in Mindanao have been very busy on Government contracts, both military and civil. They have also several fair sized shipments to China and a trial order to Australia. Transportation facilities have improved because the confiscated German ships carry lumber cargoes.

The propaganda of the rangers regarding caiñgins and homesteads has had favorable results and the number of homestead applications has increased and the number of illegal caiñgins in the forest has decreased.

The investigation made by the chief, division of investigation, regarding forest resources, especially minor forest products, in the provinces of Bukidnon, Davao, and Cotabato, has been of material assistance to this district.

Owing to market conditions, only the most salable minor forest products were gathered. The chief of these are almaciga, gutta-percha, rattan, firewood and tanbark.

The work in establishing communal forests is progressing slowly because of the enormous extent of the municipalities. Before announcing the establishment of a communal forest for a town, it is necessary to locate a parcel for practically every barrio, as it would be unfair to establish a communal forest unless al sections of the municipality can be benefited thereby.

District No. 9.—A new station was established at Coron in order to facilitate the work in the northern part of this district. Lumbering conditions have been improved during the year because, in addition to a steamer which calls at ports on the east coast, two auxiliary schooners make trips to the west coast.

Cattle owners have caused some friction among the people by closing trails and excluding homesteaders from the land that they have applied for. This trouble is now being adjusted by the Bureau of Lands.

The forest officers have been coöperating with the provincial authorities regarding the settlement of agricultural regions by the mountaineers. Noncommercial forests have been set aside for their use, as these people are compelled to depend upon the caiñgin system of agriculture for their crops.

Inspection work is very difficult because of the lack of trails along the coast. All coastwise travel is either in a steamer that calls at irregular intervals or by means of small dugout boats which cannot venture out if the surf is high. Unlike other parts of the Philippines, both the northeast and southwest monsoon sweep along both coasts, thus making traveling in a small boat difficult at all times.

District No. 10.—Lumbering has been up to the average throughout the district, but the scarcity of ships in Masbate and the prevalence of rinderpest in Leyte retarded operations in those provinces and, as a result of this and the demand for labor in abaca (Manila hemp) fields, the price of lauan lumber rose from ₱50 per thousand board feet to ₱70.

More field notes have been taken in this district than in any other because of the systematic effort made to secure data regarding remote forests.

District No. 11.—The portion of Nueva Ecija which was formerly in district No. 11 was transferred to District No. 4,

which made the district more compact than formerly. There has been little change in the relative number of licensees or in the output of lumber. There is, however, a great demand for firewood, with the result that every available area is being utilized. Efforts are being made to reduce the amount of illegal cutting in Bataan. Owing to the constant demand for bancas around Manila Bay, it is very profitable to manufacture bancas and illicit cutters find a ready market for their wares once they are removed from the forest. It is hoped that by issuing permits to the banca makers, it will be possible to reduce the amount of illegal cutting. It seems that the restrictions imposed by certain licensee upon their laborers make it unprofitable for individuals to lawfully engage in the business of making bancas.

A detailed study has been made of the mangrove swamps and nipa plantations and also of fishponds in Pampanga, in order that the Bureau of Forestry may establish a uniform policy in the management of public mangrove swamps.

Throughout the greater portion of the district, caiñgin making in public forest has almost ceased. The Negritos are confining their operations to tracts of land which had been set aside for their exclusive use and, in other regions, the patrol maintained by guards and talks given by rangers have been sufficient to reduce further forest destruction to a minimum.

As many firewood licensees are cutting upon nonagricultural land close to the beach, an effort will be made during the coming wet season to supply all of them with ipil-ipil seed in order that they may stock their areas with trees. If this is not done, the probabilities are that the cut-over land will be covered with cogon.

District No. 12.—Early in July, District No. 12 was divided into two parts because of the poor mail facilities between northern and southern Mindoro. There has been no notable increase in the amount of timber cut, but the firewood cutters have been very active.

The provincial government of Mindoro has started a project in behalf of the Mangyans, a tribe of mountaineers. In order to encourage these people to settle down in villages where they can be educated, the government has established trading stores at which they can exchange forest products for their needs. To facilitate this enterprise, minor product licenses have been issued to the provincial treasurer. Forest officers have also designated suitable tracts of land in the vicinity of the stores, which these people can cultivate.

There has been a great influx of settlers from Panay and Luzon, with the result that caiñgin making is still very prevalent.

The cadastral survey in the vicinity of Calapan has kept a ranger busy looking after the interests of this Bureau.

District No. 13.—The officer in charge of District No. 13 was absent on leave for a considerable period, but the other ranger kept up the work, which consisted chiefly in looking after firewood licensees, inspecting homesteads and areas which were to be cleared.

He was also sent on special trips by the undersigned when the personnel of other districts needed assistance.

District No. 14.—In order to take advantage of steamship service out of Cebu, a new district was established, known as District No. 14. Agusan, formerly in District No. 8, Negros Oriental, Cebu, and Bohol of District No. 7, were united to form this district. The officer in charge and two of the rangers were detailed in June and since then, they have made detailed examinations of mangrove swamp areas in northern Bohol.

The fuel shortage has led to prospecting for coal and three new coal beds were found near the Cebu–Toledo Road. One of these is being developed by a timber licensee. The rangers, on their part, are doing what they can to induce sugar cane planters to raise their own firewood on waste lands near their mills and thus reduce the demand for mangrove firewood.

DIVISION OF FOREST LANDS AND MAPS.

ORGANIZATION.

Because of the considerable increase of work in connection with subjects pertaining to both public and privately claimed lands, it became necessary to establish this division in order to take over from the former division of administration all those subjects which affect the legal status of forest lands. All other work regarding personnel and the handling of forest products was charged to the Division of Forest Management.

The different subjects pertaining to forest lands were divided among the following sections:

Public forest lands cases.
Private forest lands register.
Public lands applications.
Forest reconnaissance.
Forest zones, reserves and communal forests.
Mapping and drafting.

PUBLIC FOREST LANDS CASES.

This section is charged with receiving from the General Land Registration Office all notices of court proceedings for the registration of lands claimed as private property, and prepares the necessary information regarding the character of the soil and vegetation in order to decide whether it is or is not advisable for the Bureau of Forestry to take action in opposition to the claims.

The following table shows the status of the claims received during 1917:

Number of notices of hearings.

	Number received.	Action taken.	No action necessary after inspection.	Pending decision of court.	Adjudicated to the Insular Government.
					Hectares.
Cadastral	10	4	1	1	775, 73.32
Ordinary	999	114	59	32	171, 92.65
Grand total	1,009	118	60	33	947, 65.97

Since the Bureau of Forestry established a more exacting system in the examination of this class of lands, the practice of applying for their registration without any title other than the very doubtful right of occupation has notably decreased, as may be seen from the great difference of the area which was adjudicated to the Government in 1916, 20,400 hectares, against 948 hectares in 1917.

FOREST LANDS REGISTER.

It is the duty of this section to examine the legality of titles or documents which are submitted as evidence of ownership for their inscription in the Bureau of Forestry, in accordance with section 1829 of the Administrative Code, and also to secure all information regarding the character of the land. These data are forwarded to the Collector of Internal Revenue, together with the approximate data of the forest area and species and quantity of timber and other forest products, in order that the owner may use his woodland without hindrance.

The following table shows the private woodlands registered up to December 31, 1917.

Registered private woodlands.

Calendar year.	Number of—			
	Parcels.	Hectares.	Ares.	Centares.
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,215	86	62
1910	4	8,653	85	22
1911	5	533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
1917	48	7,985	68	39
Total	907	317,587	95	33

PUBLIC LANDS APPLICATIONS.

This section is charged with recording all requests forwarded by the Bureau of Lands for certification as to the agricultural or forest character of land applied for by settlers, a duty which was imposed on the Bureau of Forestry by the Congressional Act of July, 1902. It distributes the applications to the different forest stations for the necessary examination of the land, studies the reports submitted by the examining officers and prepares the agricultural or forest certificate for the Bureau of Lands.

The same conditions and difficulties, or probably greater difficulties than those mentioned in previous reports, existed during the year, and for this reason this Bureau maintains more strongly than ever the opinion that the Government should restrict the occupation of agricultural lands to surveyed tracts instead of permitting private individuals to choose arbitrarily the separate parcels for which they wish to apply.

The table in the appendix shows the distribution of applications in the different provinces of the Archipelago, the summary of which is as follows:

Applications on hand during 1917		13,014
Certified for agriculture	8,207	
Certified for forestry	830	
Returned uncertified	174	
		9,211
Total pending December 31, 1917		3,803

FOREST RECONNAISSANCE.

This section, composed of especially trained forest officers, is charged with all field and office work regarding forest reconnaissance, which is a necessary prerequisite for the proper ad-

ministration and utilization of the areas set aside for forest purposes. For example, the industries, whether already established or proposed, that depend on forest products need more detailed information regarding the forest resources and the methods of exploitation best fitted to assure a continuous supply of raw material for such industries.

The mining industry is the one which is most likely to suffer from the effects of an unrestricted use of the forest resources, as well as certain other industries which, due to the high cost of coal, depend on the forests for fuel.

At the request of the interested parties, and in some cases on its own initiative, the Bureau of Forestry carried out during 1917 the following reconnaissances:

1. Mineral regions of Baguio, Benguet; Aroroy, Masbate; Paracale, Ambos Camarines; and Mambulao, Ambos Camarines.
2. Mangrove swamps in the bays of Basiad, Calauag, Lopez and the western part of the Bondoc Peninsula, Tayabas.
3. The coal region of the peninsula of Sibuguey, Zamboanga.

The two last reconnaissances are still in progress.

FOREST ZONES, RESERVES AND COMMUNAL FORESTS.

The object of this section is to carry out the study and demarcation of those forest areas which ought to be retained as such and to investigate the legality of all claims within their limits, in order to determine definitely the areas which should be proclaimed forest reserves.

During the year, studies have been made in the following forest zones, which in the near future it is proposed to establish as reserves: Mounts Banahao, San Cristobal, and Arayat, and the central part of Tayabas lying between the towns of Atimonan, Mauban, Sampaloc, Tayabas, Pagbilao, and Laguimanoc. In the areas here proposed as reserves, cultivation and the destruction of the forests are proceeding at a rate that threatens the adjacent agricultural land and the public good.

Other reserves which should be considered during the coming year are the areas under license agreements and the mangrove swamps.

The conflicts and friction arising from the occupancy, whether legal or otherwise, of public land needed for forest purposes, make it necessary that the Bureau of Forestry should have control over the forest areas the exploitation of which has been granted to corporations by public auction and under license agreements. The Bureau will thus be able to retain permanently the rights of way and other land needed for conducting lumber-

ing operations. Not only is this action necessary to prevent the litigation with which the claimants or occupants of the land often attempt to obstruct the building of railways or other logging transportation lines, but also to prevent these same occupants from destroying the stand of timber and the reproduction, objects that can at present be attained only in a limited measure and then only by maintaining a large force of guards.

Such reserves will embrace only the forest areas which have been designated in the license agreements, beside the rights of way for the extension of railways which connect the forest with the sawmill or with shipping points, in the cases where these are situated outside the area of the concession. As exploitation proceeds, the limits of the reserves may be modified, so as to exclude from them such areas as have been cleared of timber and are judged to be fitted for agricultural purposes.

The legal status of the mangrove swamps, a matter which has been in litigation since long before the end of the Spanish régime, is of such importance that it is receiving special attention on the part of the Bureau.

The reasons for proclaiming all public mangrove areas as forest reserves are based on the opinions and recommendations of the former "Inspección General de Montes" (that is, the Bureau of Forestry of the Philippines), which recommendations were supported by the "Cuerpo Nacional de Ingenieros de Montes" (that is, the Forest Service of Spain), even as they meet with the support of the Foresters of the present day, defenders, like those of the other régime, of a farsighted policy of conservation of our forest products.

Don Sebastian Vidal, considered among his colleagues as an eminent authority and better acquainted than any other with forest conditions in the Philippines, divided all the forests into six types, namely: Mangrove swamps, beach, lowland, highland, and two mountain types. Of the mangrove swamps he said in 1883:

In the mangrove zones are included all the salt swamps and marshes which are constantly washed by the waters of the sea and subject to the flow and ebb of the tides. Now this very condition, according to the laws of waters, puts these areas in the category of *public dominion* and *public use;* moreover, for the reason that in such areas there may be assured a constant tree growth, to counteract the effect of the disease-breeding vapors that emanate from them and threaten the public health, *the State is under the obligation to preserve them as forest zones.*

These recommendations and others made by various foresters induced the Governor-General of the Philippines in 1893 to order the suspension of all action on cases referring to mangrove swamps.

To-day the Bureau of Forestry holds the same opinion and will begin the establishment of such reserves in order to regulate the disposition of these areas for the benefit and protection of the sugar, alcohol and tanning industries, of fishponds and saltpans, charcoal burning, and such others as may be established for using the products of the mangrove swamps.

The object of establishing such reserves will be to regulate, by a system of leasing, the disposition and occupancy of these areas, in order to prevent the arbitrary construction of dikes, which, by interfering with the ebb and flow of the tides, would affect the development of the trees of the mangrove forests and nipa areas, or perhaps even kill them by depriving them of the very elements necessary for their growth.

This section also has charge of the establishment of communal forest, for the free use of local residents, and the accompanying table shows the present status of this work.

Communal forests are established as permanent or temporary, according to the soil conditions and the needs of the locality. If a permanent communal forest is decided on, its boundaries are made to include not only actually forested areas, but also adjacent public land which, though not covered with tree growth, is not fitted for agricultural uses, so that sooner or later it may be reforested, either by natural or artificial means. With this object in view, the Bureau of Forestry offers its coöperation to local authorities in the celebration of arbor day.

Temporary communal forests are established where the character of the terrain is such that it ought to be thrown open to agriculture as soon as the timber has been utilized; in this class of communal forests no limits are put on the amounts of timber to be taken out, nor are there any restrictions on the occupation of the land once the timber has been removed.

MAPPING AND DRAFTING.

This section is charged with all work pertaining to the indexing of sketches and the compilation of field notes, both topographical and forest valuations, taken by officers of the different forest stations.

The following table shows the work carried out during the year:

Trail notes.

District No.	Receivable.	Pending.	Total.	Forest Value.
	Kilometers.	*Kilometers.*	*Kilometers.*	*Hectares.*
1	121.43	129.75	126.18	51.80
2	70.21		70.21	9.50
3		44.36	44.36	
4	229.48	194.36	423.84	20.50
5	519.23	210.49	729.72	95.18
6	459.31	325.47	784.78	33.20
7	429.79	184.77	615.56	13.55
8	476.79	148.61	624.98	45.41
9	79.21	2.35	81.56	2.50
10	1,048.49	158.69	1,207.58	69.29
11	192.21	206.31	398.52	6.90
12		56.84	56.84	.25
13	65.14	21.60	86.74	4.02
14	130.76	68.92	199.68	5.00
Total	3,821.63	1,753.52	5,575.15	357.10

Most of the above notes have been compiled on the base maps, on which there have also been added new and valuable data from the Bureaus of Coast and Geodetic Surveys, Lands, Public Works, Constabulary, and the Division of Military Information. Eighty-four maps of communal forests have been prepared and 1367 blue-print copies of different maps have been made for the general public and for official purposes.

Communal forests established from 1908 to 1917.

Years.	Parcels.	Hectares.
1908	17	5,869
1909	21	8,279
1910	19	5,792
1911	47	13,562
1912	59	10,790
1913	25	3,362
1914	45	6,790
1915	94	13,049
1916	107	15,627
1917	84	10,035
Total	518	93,155

COMMUNAL FORESTS CANCELED.

Provinces.	Parcels.	Hectares.
Bulacan	1	232
Cagayan	1	325
Ilocos Norte	4	1,177
Misamis	1	400
Negros Occidental	2	280
Tayabas	1	126
Total	10	2,540
Total number of parcels and hectares established from 1908 to 1917	518	93,155
Total number of parcels and hectares cancelled in various years	−10	−2,540
Balance in force	508	90,615

serving 1268 Townships

Left 180 Ha each = 450 acres

Statement of communal forests established up to December 31, 1917.

Provinces.	Parcels established—		Total.	Mun. townships or rancherias.	
	Before 1917.	During 1917.		With C. F.	Without C. F.
Abra	19	1	20	13	6
Albay-Catanduanes	10	1	11	8	13
Ambos Camarines	24	6	30	23	15
Antique	1	2	3	2	10
Bataan	13	-------	13	11	-------
Batanes	-------	-------	-------	-------	6
Batangas	-------	-------	-------	-------	22
Bohol	9	2	11	9	26
Bulacan	-------	-------	-------	-------	24
Cagayan	27	3	30	17	6
Capiz-Romblon	25	6	31	17	14
Cavite	-------	-------	-------	-------	20
Cebu	3	5	8	6	42
Ilocos Norte	16	-------	16	14	15
Ilocos Sur	20	-------	20	17	23
Iloilo	10	-------	10	5	22
Isabela	15	-------	15	11	15
Laguna	11	-------	11	10	17
La Union	10	-------	10	10	4
Leyte	15	4	19	12	33
Mindoro	-------	-------	-------	-------	17
Misamis	12	2	14	10	42
Mindanao and Sulu—					
Agusan	1	-------	1	1	56
Bukidnon	-------	1	1	1	12
Cotabato	-------	-------	-------	-------	30
Davao	-------	-------	-------	-------	15
Lanao	1	1	2	2	36
Sulu	-------	-------	-------	-------	24
Zamboanga	3	-------	3	2	8
Mountain Province—					
Amburayan	6	-------	6	5	4
Apayao	-------	-------	-------	-------	5
Benguet	1	-------	1	1	12
Bontoc	-------	-------	-------	-------	7
Ifugao	-------	-------	-------	-------	3
Kalinga	-------	-------	-------	-------	4
Lepanto	1	-------	1	1	10
Occidental Negros	17	8	25	14	10
Oriental Negros	12	2	14	12	84
Nueva Ecija	9	7	16	15	38
Nueva Vizcaya	-------	1	1	1	7
Palawan	-------	-------	-------	-------	14
Pampanga	2	1	3	3	18
Pangasinan	29	1	30	23	42
Rizal	3	1	4	3	22
Samar	27	11	38	29	11
Sorsogon-Masbate	13	-------	13	10	14
Surigao	7	4	11	7	2
Tarlac	6	1	7	5	11
Tayabas	32	13	45	25	8
Zambales	14	-------	14	12	2
Total	424	84	508	367	901

The chief of the division and the six rangers attached to it spent in all 399 days in the field on reconnaissance work in Bukidnon and Lanao, Mindanao; in rectifying the forest zones in Mount Banahao and central part of Tayabas; in the mineral regions in Paracale and Mambulao, Ambos Camarines; Aroroy, Masbate; Sibuguey Peninsula, Zamboanga; and in the examination of forest lands in the cadastral surveys at La Paz, Tarlac; Talavera and Cabanatuan, Nueva Ecija; and Montalban, Rizal.

DIVISION OF INVESTIGATION.

This division has its headquarters within the Makiling Forest Reserve, in Los Baños, Laguna, and its work is carried on in the most intimate coöperation with that of the Forest School, this latter being, in fact conducted by the same officers as an integral part, so to speak, of the division. Whenever and wherever it is possible without detriment to the course of instruction, the work of pupils of the school in surveying, mensuration, silvical studies, and so forth, is done in such a way as to forward the investigation and working out of forest problems which the division has to solve. In this way there are obtained, on the one hand, data of great value for the division and for the Bureau in general while, on the other hand, the students are given an intensely practical training in the field along the very lines on which they will have to work when they enter the service as rangers. It will be seen than the division acquires in this way a great amount of highly valuable information about one of our greatest assets, the forests, without incurring any additional expense to the Government.

RECONNAISANCE.

The division has not been actively engaged in any extensive pieces of reconnaisance during the year, though different members of the staff have, at vaurious times, been detailed to accompany the larger reconnaisance parties sent out by the Bureau.

The classes in forest management have continued to do small pieces of reconnaissance on Mount Makiling. The work done during the year made possible the completion of the forest map of the Mount Makiling region.

This year's summer instruction trip added the reconnaissance of a 3,000 hectare area in the Northern Laguna forest.

Reconnaissance work in small areas has been continued by rangers in District No. 5. This work does not properly belong to the Division, but it is mentioned here as having always been of special interest. It was started in 1912 by the district forester as part of his work in coöperation with the division.

DENDROLOGY.

1. *Check list of the woody plants of the Philippine Islands.*—This has been brought up to date, so far as the literature available here is concerned. It is kept on library index cards and is used pretty constantly. This year all the common names have been compiled and copied, so that they can be used in our seed studies and other work. If it is ever desired to publish the check list, it will be necessary to check all the references and to bring the statements concerning distribution up to date.

2. *The Makiling flora.*—Each of the last five years has seen considerable additions to this work. The rough draft of this report contains about 1,600 pages. As the region covered is a peculiarly rich and representative one, the number of species included thus far is about 2,000.

DENTROLOGY LECTURES.

A set of lectures has been prepared for use in the dendrology class. These lectures supplement Bulletin No. 10 and run to about 650 typewritten pages.

MINOR FOREST PRODUCTS.

For several years past, information has been collected leading to the preparation of a special report on the minor forest products. It was desired that this report should not be merely a compilation, for the Bureau already had some compilations on the subject. The most concise compilation is that in Bulletin No. 10, Part II., pp. 51–62. Besides this, there is one on minor forest products prepared in 1914–15. A portion of this was published by the Bureau of Foreign and Domestic Commerce, Department of Commerce, U. S. A., in its Special Agents Series No. 95, pp. 1–40, under the title "Rattan Supply of the Philippines."

In the following paragraphs, the effort has been made to show the present state of progress in our study of the different minor forest products.

(*a*) *Mangrove swamp work.*—Measurements have been made of the yield in planted swamps, so that it is now possible to write the section on mangrove swamps for the minor forest products publication.

(*b*) *Bamboo.*—Late in 1912 an experimental planting of about 2 hectares of Kauayan (*Bambusa spinosa*), Kauayan-kiling (*Bambusa vulgaris*), and Boló (*Gigantochloa levis*), was made on land now belonging to the College of Agriculture, between the Pili and Mulawin Rivers.

A number of studies of growth and yield of bamboo were made. These led to the preparation of a special report on bamboo which was submitted January 16, 1914.

Since that date, the progress of the planting has been covered by yearly reports. The last one was a report presented at the departmental conference on October 27, 1917.

Our original plantings are, this year, producing canes of full size; so it is apparent that planted bamboo may begin to yield a small amount of commercial material five years after planting.

We have, this year, planted an additional 2 hectares of Kauayan in our permanent plantations. In five years more this should begin to yield bamboo for repair work, fences, etc.

Studies have been made to ascertain whether the reproduction of Buho or Caña-boho (*Schizostachyum lumampao*) was as rapid as has been believed. The studies made in Bataan indicate that this species is neither so aggresive nor so rapid a grower as was supposed.

(*c*) *Rattan.*—The work on this has gone slowly, because of the difficulty attending the collection and indentification of herbarium material of rattan, and the very great difficulty experienced in getting standard classifications of trade samples.

The different Philippine rattans have been listed and their distribution recorded, so far as they are known.

(*d*) *Gutta-percha.*—In April and May of the present year, accompanied by two rangers, the chief of the division made a trip through the Bukidnon, Lanao, and Cotabato regions of Mindanao to study gutta-percha. Unfortunately, it was found that gutta-percha is not being collected at present, as a result of war conditions. Collections were made of the more valuable kinds of gutta trees. The trees were not in flower or fruit and the identifications of the sterile material have not been entirely convincing. It would seem that gutta-percha will never again be of very great importance in the Philippines, unless it can be successfully planted.

There have been included in our files lists of the known species of Sapotaceae of the Philippine Islands, keys to genera and copies of published articles on gutta-percha.

(*e*) *Rubber.*—During this year there has been worked out a classification of the baletes (wild figs) of the Mount Makiling region and we are now able to recognize the local species. Collections of latex are being made and the samples promptly analyzed by a member of the College of Agriculture. They show a low rubber content and a high percentage of resins. It has been found very difficult to collect the samples, because the latex flows very slowly and coagulates rather quickly. The experiments have not yet been continued for a sufficiently long period to determine in which season the latex flows most readily. Thus far there is no indication that any of the baletes are likely to prove profitable sources of rubber.

(*f*) *Philippine palms.*—It was the intention to include with the report on minor products a rather full account of Philippine palms, but it has not been posible to complete this work. A list of all known Philippine species, a table of the reported

distribution, a list of the principal publications and a key to Philippine genera have been prepared and included in the files.

ARBORETUM.

The arboretum has received some accessions and the work of identifying and labeling has been continued as fast as possible.

WOODY VINES.

Our forests contain a large number of woody vines. Some of these are of considerable importance as sources of minor forest products, but our knowledge of them is very incomplete. In July of this year, the systematic collection of all species found in the Mountain Makiling region was begun and up to the end of the year some 35 species had been brought in. Good herbarium material and a section of the mature stem have been collected in each case.

HERBARIUM.

In connection with the dendrology instruction work there has been prepared a herbarium.

This now includes material of some 600 species of the local woody plants and is being continually enlarged. There has also been secured material of a number of the important timber species from other parts of the Islands.

SILVICULTURE.

1. *Nurseries and plantations.*—These now cover an area of over 30 hectares of permanent plantations, 1,374 hectares of special dipterocarp plantations, 0.647 hectares of rattan plantations and 32 hectares of experimental grass land planting on Mountain Makiling.

Monthly growth measurements are taken for all plants in the nursery, quarterly measurements of the trees in the plantations and yearly measurements of the planting on the mountain.

To date, about 650 species have been planted in the nursery and plantations.

It has been demonstrated that Ipil-ipil (*Leucaena glauca*), Narra (*Pterocarpus* spp.), Molave (*Vitex* spp.), Lanutan I. (*Bombycidendron vidalianum*), large-leaved mahogany (*Swietenia macrophylla*), Calantas (*Toona calantas*), Sibucao (*Caesalpinia sapran*), Teak (*Tectona grandis*), Lumbang (*Aleurites moluccana*), and Bagilumbang (*Aleurites trisperma*) are suitable for planting on a commercial scale. Besides these, Brazil Logwood (*Haematoxylon campechianum*), Banalo (*Thespesia populnea*), Palomaria de la Playa or Bitaog (*Calophyllum inophyllum*), West Indian Cedar (*Cedrela odorata*), Banuyo

(*Wallaceodendron celebicum*), and Betis (*Bassia betis*) offer a great deal of promise.

2. *Measurement of best trees.*—The measurements which are regularly recorded for the plants in the nurseries and plantations are average measurements. It has been felt that the average measurements did not show all that the planting might be made to show concerning the conditions and rates of growth. It frequently happens that a part or most of a planting receives more shade than is desirable. This will result in giving a low average rate of growth, although individual plants, which are more fortunately situated, may show a rapid rate. To give some notion of the best rates of growth secured in each planting, a special series of measurements was made in October of this year. The best tree in each lot was selected, marked with white paint and measured. The results were tabulated by hectares, a general table was prepared to give the measurements for the best tree in each lot, and, finally, a special table was prepared to show the best tree of each species in the plantations.

It is expected that these trees will be measured year after year in order to show whether the best individual are capable of growing for a number of years at a faster rate than the average. The taking of these growth records of best trees will also provide a sort of check on the regular growth measurements.

3. *Thinnings.*—The plantations at this place developed to a stage where thinning is necessary. This year, the preparation of a plan of thinning has been assigned to certain students. When the plan has been approved, laborers are sent into the area and do the thinning under the direction of the student in charge. The material taken out is cut into firewood length and piled. Careful records are kept of all details of this work, including cost.

4. *Cebu planting.*—In May, 1916, the district forester of District No. 5 with one ranger went to Cebu to inaugurate the planting project undertaken on the Talisay Estate.

The forester remained on the work until August, 1916, and the ranger till September, 1917. One thousand three hundred fifteen hectares were planted with ipil-ipil, lumbang and bagilumbang in the two years. The total cost of the project to date, exclusive of salaries of forest officers, has been ₱7,000.

The work has been remarkably well done. A report on the two year's work was given at the departmental conference, on October 6.

Another appropriation of ₱10,000 will be needed in order to finish the planting of the whole area, within the next three years.

5. *Growth studies.*—(*a*) *Of dipterocarp trees.*—The taking

of measurements begun in 1912 and in 1914 has been continued during this year. The last report on these data was presented before the Departmental Conference, September 10, 1917.

(*b*) *Of unit areas.*—During the present year there has been begun a series of studies of total wood production on areas of definite size. One-fourth hectare plots were marked and all trees on them numbered and measured. These measurements are to be taken once a year. It is expected that this will give a measure of the success of the forest.

6. *Silvical leaflets.*—The classes in silviculture in the Forest School have continued the work of preparing silvical leaflets. There are now leaflets for about 120 species, containing a considerable amount of new information.

7. *Experiments with cuttings.*—For several years, classes in Silviculture II, have had a certain amount of work to do with cuttings, as a part of their regular nursery practice. The results of this work have been carefully tabulated and have given useful information concerning a number of species. Thus far information concerning the behavior of cuttings of 143 species has been secured.

8. *Forest grown seedlings.*—Each class in silviculture has done work with seedlings which were pulled in the forest and transplanted by the bare root method. Careful records have been kept, which now show the results of the work with 45 species.

9. *Root development.*—Two years ago, there was begun a systematic study of the root development of different timber trees, particularly with reference to its effect upon nursery and plantation practice.

A feature of this work has been the preparation of mounted herbarium material, for use with classes in Silviculture.

Thus far 279 species have been studied. This work promises to be increasingly useful.

10. *Reproduction studies.*—In 1913, there were laid out five permanent reproduction plots in the cut-over area at Limay and these have been carefully examined and reported upon twice each year. Two additional plots were laid out in the same year. Last May, there were laid out seven additional plots. There are now thirteen permanent reproduction plots under observation. These are expected to show how reproduction is taking place on each year's cutting area and to show the effect of fires upon reproduction.

The last report on these plots was presented June 15, 1917. Another examination of the plots has just been made and the report will be ready by the time this goes to print.

11. *Cost records.*—It has been felt that more detailed records of cost were needed than have heretofore been kept of plantation of work.

This year, such cost records have been kept and it is expected that they will give much more complete information than has been possible heretofore.

FOREST MANAGEMENT, ENGINEERING, AND UTILIZATION.

1. *Durability tests.*—The semiannual examinations of all the durability test specimens have been made this year, as before; the last progress report on the test was made September 10, 1917. The number of pieces included in all tests up to date is 1,128, representing 234 species. It is intended to publish a progress report on durability tests during 1918.

2. *Wood preservation.*—A galvanized-iron tank has been provided for experiments in creosoting bamboos and posts by the open-tank method. The experiments will be begun as soon as the preservative can be obtained.

3. *The wood lot.*—It has now become evident that the thinnings from the plantations will furnish a considerable quantity of firewood. A plan has been prepared giving the location of the proposed wood lot. If authority can be secured to sell the firewood and use the receipts for hiring additional labor, the cutting and use of firewood from the plantations can be better systematized.

4. *Firewood studies.*—A series of studies has been carried on during the year of firewood production, cost of cutting, and loss of weight from evaporation of moisture. Also efforts have been made toward determining the average amount of firewood used in a Filipino community.

FOREST NURSERY, BAGUIO.

Nearly 20,000 cuttings have been planted to restock the nursery, besides seedlings secured from other gardens in Baguio. Of the 52 species planted, 13 came from abroad.

A portion of the nursery has been set aside to maintain seed trees.

Trial plantings of economic species have been carried on with eucalyptus, hickory, oaks, peach, pear, apple, gooseberry, raspberry, and ricinus. Most of the cinchona seedlings planted in 1916 have died.

With the coöperation of Lieutenant Governor Logan and Mayor Williams, a beginning has been made toward distributing economic species among the Igorots.

There are in the nursery about 3,500 trees of those species that have been found to succeed and about 4,000 shrubs and

1,000 vines. For reforestation experiments, about 700 camphor trees, 400 eucalyptus and 600 Mindoro pines are left.

The total available stock for all work in 1918 is about 6,000 trees, 11,000 shrubs and 2,000 vines.

Of eight species of foreign pines tried, none have succeeded very well. *Pinus longifolia* and *Pinus rigida,* which have done best, have not yet reached transplanting size, though nearly 3 years old.

Plants given out for reforestation, for coöperation with the city of Baguio and residents and visitors, amount to 26,166, valued at ₱5,062.52.

About 300 camphor trees have been put into the reforestation plots in Forbes Park No. 3, and smaller groups of several other species in Forbes Park Nos. 1 and 2.

Trinidad Farm School has planted about 500 trees.

By coöperation with the Benguet Mining Company, over 14,000 cuttings of Mirasolia (*Tithonia diversifolia* A. Gray) were planted in grasslands at the headwaters of Antamok Creek.

Some of the natural drainage channels in Forbes Park have been straightened and lined with rock to prevent erosion.

Much attention has been given to the grazing and caiñgin problems. Guards patrol the region constantly and every effort is being made to gain the coöperation of the Igorots in suppressing fires and caiñgins.

FOREST SCHOOL.

The school year 1916–17 closed on March 14 and a class of 21 graduated.

SUMMER INSTRUCTION TRIP.

The outstanding features of this year's work have been the work on the summer instruction trip and the occupancy of the new quarters.

The summer vacation trip this year occupied the period from March 18 to April 14. Leaving Los Baños on March 18, the class went by boat to Paete. The first week was taken up by the making of camp and composition studies. These studies covered about 5 hectares, and every thing above 10 centimeters in diameter was calipered. Following this, a good deal of work was done on topography and valuation.

WORK PERFORMED.

A 5 per cent survey was made of an area of about 3,000 hectares, every trees above 40 centimeters in diameter on the

strips being calipered. The survey showed an average stand in excess of 20,000 board feet per acre. The most abundant trees were Tiaong, Tanguile, Mayapis, and Dalingdingan,—the first three making up more than 70 per cent of the stand, by volume. A map was prepared and presented with the report on the trip on June 25. This was the most successful summer instruction trip which the school has had.

EQUIPMENT.

During the year the new Forest School building has been occupied. It is a very great aid in the work of the school. New quarters were completed and were occupied on October 27. A commodious and convenient mess hall and kitchen have been built and a considerable amout of grading has been done on the road and grounds. Further improvements needed are: A first-class road, the installation of an electric lighting system, and the development of the grounds and additional laboratory and surveying equipment. It is hoped that it will be possible to secure these the coming year.

ADVANCED COURSE.

The course leading to a degree has not been offered this year, because of lack of personnel. Two additional men are needed. It is hoped that they can be secured and the course may be offered, beginning with the next school year.

MILITARY DRILL.

Military drill was begun in the Forest School on October 12, 1917. All Filipino students are required to drill. A number of other employees are also taking the course. Two drills are held each week and distinct improvement is being shown. Guns and other equipment should be supplied for this work.

STUDENTS.

The junior class, which began its work this school year, numbers 20, and 3 private students, 2 of them from China. The senior class numbers 21, including one private student from China.

DIVISION OF SAWMILLS AND UTILIZATION.

DUTIES.

In addition to relieving the division of forest management of the administration of the long term concession areas and sawmill licenses and administering the law providing for scaling of legs in the round, the Division is charged with the pre-

paration of a set of grading rules suitable to Philippine timber and the training of a corps of lumber inspectors.

Coöperation with the sawmills is also sought in determining and doing away with waste both in the woods and mill and the utilization of all material possible, and in the study of the various markets, both developed and those possible of being developed.

PERSONNEL.

During the past year the most competent men of the newly graduated class of the Forest School were assigned for duty under this division and together with the rangers already on duty, who have become experienced in handling the work, the administration of the sawmill licenses has been carried on in such a manner that the complaints formerly received regarding the enforcement of the scaling law have gradually disappeared and the lumbermen feel that the Bureau is working to give them all help possible in carrying on their business in fairness to their needs and the proper handling of the forest for the future welfare of the Islands.

The personnel of the division now consists of one forester in charge, 1 field assistant, 1 lumber inspector, 1 assistant forester and 21 rangers. The rangers are called upon to handle the direct supervision of the concession areas and personally meet the mill men on administrative matters as they arise, while the forester and field assistant travel around to the various mills to supervise and check the scaling and administrative work carried on by the rangers and assist them in making mill studies.

MARKETS.

Since the establishment of the division in 1915, its activities have been constantly increasing with the improvement in conditions, the beginning of which was discussed in the report for 1916.

During 1917 the output of the chief sawmills was increased some eight million board feet and mill men report that they have never before known such an active market in the Islands.

In spite of the enforced reduction in shipments to the United States and China markets during 1917, the output of the mills was increased by the marked improvement in local markets. Building activities have increased rapidly, due both to increased activities in the other industries of the Islands and the growing tendency of the local population to build frame houses instead of the poorer class of mixed material house that has been the chief form of housing for the poorer people of the Islands.

The demand for native lumber throughout the entire year was much greater than the supply, due largely to the fact that the people now realize more fully the worth of the Philippine woods, as compared with Oregon pine and other foreign lumber.

Local lumber yards carrying stocks of mill sawn lumber were established in districts where formerly whip sawn stuff, produced as scattering demand arose, was the only source of supply.

In Mindanao, the development of the large hemp and coconut plantations and accompanying settlement of former wild lands has created a market that keeps the mills filled with orders ahead.

In the Visayan Islands and Luzon the establishment of the large sugar centrals and coconut oil refineries, together with the prosperity they have brought to the people, has produced a building activity that commands a large share of the output of the mills.

The United States Quartermaster of the Philippine division, after having thoroughly tried out Philippine timber during the last two years, during 1917 supplied practically the entire needs of the army with native instead of imported lumber, placing one large contract of 6,000,000 board feet and several smaller contracts of about 300,000 board feet.

The average monthly shipments from seven of the larger mills to local markets were about 4,000,000 board feet, making a total of 50,000,000 board feet used in 1917 as compared with 35,000,000 in 1916.

With this great increase in sale of lumber there has been a marked rise in prices, due both to the large demand for lumber and the increased cost of production through the advance in cost of materials. Prices during 1917 advanced steadily and by the end of the year had more than doubled over those of 1916, while in some cases the advance was 200 per cent, with every prospect of more increases during 1918.

FOREIGN MARKETS.

During 1917 the shortage in shipping and increasing freight rates seriously affected the shipments of lumber to foreign markets, with a consequent reduction in the amount of lumber shipped to the United States and China markets as compared to 1916.

Timber and lumber shipped to the United States during 1917 amounted to 12,488 cubic meters (5,294,912 board feet) valued at ₱483,215, as compared to 14,880 cubic meters (6,309,120 board feet) valued at ₱659,186, during 1916.

The China market has experienced an even greater decline, as shown by the figures in the following table:

	1917			1916		
	Cubic meter.	Board feet.	Value.	Cubic meter.	Board feet.	Value.
To China:						
Timber	223	94,552	₱8,730	190	80,560	₱9,484
Lumber	6,453	2,736,072	121,009	15,270	6,474,480	254,828
Total	6,676	2,830,624	129,739	15,460	6,555,040	264,312
To Hongkong:						
Timber	1,166	494,384	72,842	413	175,112	6,474
Lumber	8,310	3,523,440	215,645	9,255	3,924,120	92,949
Total	9,476	4,017,824	288,487	9,668	4,099,232	99,423
Grand total	16,152	6,848,448	418,226	25,128	10,654,272	363,735

However, mill men report increased activity in this market during December, with increasing prices and numerous inquiries from China merchants giving prospect of as active markets as the shipping facilities will permit.

In addition to the shipments above mentioned, others were made to Japan, French East Indies, and Australasia, totalling 104 cubic meters (44,076 board feet) valued at ₱5,192.

As shipments were made to Australia during 1916, the continued orders from there would indicate a good possibility of the permanent introduction of Philippine lumber into that market when transportation conditions improve.

LUMBERING OPPORTUNITIES.

With these conditions prevailing and the generally expressed confidence that the market will continue firm with the great demand for building materials following the close of the European War, the opportunity for large capital to develop the long-term license areas still open in different parts of the Islands, such as Laguna, Mindoro, Camarines, Agusan, etc., should lead to a development of the timber industry commensurate to the forest resources of the Islands.

GRADING RULES.

During the early part of 1917, the Bureau secured the services of an experienced hardwood lumber inspector familiar with Philippine lumber, who was detailed to draw up a set of grading rules suitable to the local species.

As discussed in the report for 1916, the rules adopted by the National Hardwood Lumber Association were unsuitable for Philippine lumber; therefore the trade with the United States,

China, and other foreign markets, as well as numerous local deals requiring special grades of timber, made the formation of a standard set of rules imperative.

The chief advantages gained by the adoption of a standard set of rules are as follows:

1. The former custom of selling lumber log run will be done away with by the separation into the various grades,—priced accordingly,—which enables the millman to obtain the full value of the various grades of lumber, and the purchaser to obtain the grade of lumber suitable to his requirements.

2. Standard grades of firsts and seconds and export common would guarantee foreign buyers against the low grades and miscellaneous species such as have been exported at times heretofore. They would also result in a larger volume and a more satisfactory business for the buyers and sellers of export lumber.

3. Guaranteed grades will also enable the manufacturers of railroad ties, car material and construction timbers to accept the business in India and China which they could not accept heretofore on account of not being being able to guarantee the grade of their product.

A set of rules was drawn up during the year and submitted to local and foreign lumber dealers and the various lumber companies of the Islands for criticism. They have met with general approval and preparations are now under way for handling inspection under these rules, as most of the local firms have signified their desire to have inspections of their lumber made according to these rules.

In order to have a corps of inspectors to handle this work, five of the most experienced rangers of the division of sawmills and utilization were detailed to study grading work under the Bureau's lumber inspector.

Lumber mills in different parts of the Islands were visited in order that the men should become familiar with the various species manufactured in different localities. In this manner the last six months were spent, studying the different defects and qualities of lumber and learning to scale and tally it.

After becoming familiar with this work, the rangers were assigned to actual grading work, inspecting clear and merchantable grades for the Manila market and firsts and seconds for the United States market. Reinspection, with criticism and explanation, of the work done by the company inspectors was also done to show that the application of the foreign rules which were in use was impracticable.

These men are now far enough advanced to handle some inspection work and, with the instruction planned for the coming year, should develop into efficient inspectors. Positions have been offered to all of these student inspectors through the Bureau by private lumber concerns, but it was not deemed advisable to allow resignations until enough graders are available to take care of the proposed scheme of Government inspection of export lumber.

UTILIZATION.

In the administration of some of the concession areas by the division, the possibilities of doing away with various forms of waste in the forest which characterize the early stages of a new industry have been constantly brought to the attention of the loggers, so that the use of saws in felling trees and cutting logs, the doing away with the excessive sniping of logs and such forms of waste are receiving more and more attention. Furthermore, the enforcement of the law requiring scaling of logs in the round and payment for the solid contents has caused lumbermen to study the possibilities of utilizing the smaller material which formerly went into the waste pile. As a result, the large mills have installed machinery for turning out balusters, moldings, barrel staves, and box shooks from slabs and trimmings.

Three of the large mills installed automatic lathes for turning out balusters, table legs and similar material from their shorts, while a fourth has installed a sticker for the manufacture of mouldings and quarter round out of edgings which they were formerly unable to dispose of. The erection of a stave mill with horizontal band resaw, gang ripsaw and two-saw trimmer has enabled still another to utilize its slabs, which formerly went to the waste burner, in manufacturing cement barrel staves. Approximately 300,000 board feet of staves per month are manufactured, all of which go to the China market. With the installation of a barrel making plant in Manila, which is at present dependent on imported staves from the United States, the setting up of stave machines as an adjunct to sawmills should prove a profitable investment as waste material could be utilized.

Material for boxes and furniture stock also utilize the trimmings and slabs of one of the mills, the better grades of furniture stock finding a profitable market in the United States.

The production of veneer is also an assured industry in the Islands, one mill having installed both a 12-foot veneer slicer and two circular veneer saws and a dryer, for the manufacture of veneer for the United States market and cigar-box material for local trade.

THE OFFICE OF THE WOOD EXPERT.

With one exception, no radically new line of work has been taken up in this office during the year. The exception is that one of the rangers attached to the office has accompanied the party of rangers making studies in scaling and grading at mills in Occidental Negros, Bataan, and Lanao under the Lumber Inspector in charge of this work. These studies were begun in July and are expected to be finished in January, 1918. With this added experience on the part of one of its members, the office of the wood expert will be better able to form an opinion on questions that occasionally come up involving matters of wood identification, scaling and grading.

BOTANICAL SPECIMENS.

The number of botanical specimens received from the field has fallen off considerably as compared with the previous year. This is undoubtedly due, on one hand, to the fact that no special reconnaissance work has been carried on except in mangrove swamp regions, where the number of species is very limited, and, on the other hand, that there has been a great increase in homestead and other purely administrative routine work, the former especially taking field officers into a terrain where botanical collections are of little interest. There were 623 botanical specimens received during the year, of which 118 were accompanied by wood specimens. The Bureau of Science returned 400 duplicate herbarium sheets from this material, for distribution to forest stations. Beside the wood specimens with botanical material, 323 trade samples were received and identified, and about 40 numbers added to the series of foreign specimens. These last now amount to about 1,650 numbers. Ten 10-foot planks and four logs, almost all of species new to the collection, have been installed. Also, 16 planks showing the different grades of lumber as inspected by the Bureau were added to the collection.

Phenological reports to the number of 309 were received, con taining 1,839 tree names, and three lists of synonyms with 57 names.

ACCESSIONS AND WOOD SAMPLES.

Although the number of accessions of logs, planks, and smaller wood specimens has been less than in several former years, a very large amount of work has been done in working up old material, so that there are now on hand for sale or distribution hand specimens of over 275 species, of which the great majority are of well-seasoned material. The distribution of these speci-

mens has increased proportionately, over 8,500 having gone out during the year. Of these, 996 were sold, 3,513 distributed gratis (chiefly to schools and colleges, foreign forest services and other Government entities, museums, etc.), 2,446 were furnished to the Forest School, and 1,178 to the various forest stations throughout the Islands. Of the extent and value of this form of propaganda, some idea can be obtained from the following lists of countries to which the hand specimens have gone: Australia, Canada, Cuba, England, French Indo-China, Hawaii, Hongkong, Japan, Java, Korea, New Zealand, Russia, Straits Settlements, United States (21 different States).

OTHER WORK.

Beside the preparation of hand and shelf specimens and the installation of logs and planks in the working collection, there have been made in the shop about 20 simple racks for holding commercial exhibits of articles in sacks, such as almaciga, cinnamon and other barks, etc.; the large transparencies made in Washington for the Panama-Pacific International Exposition have been mounted in the windows of the ground floor; a rack (itself consisting of authentic specimens of bamboo) has been erected to display all the manufactured articles of bamboo; the work of overhauling all the damage caused to planks by shipping to San Francisco has been almost completed; and a number of pieces of office furniture have been repaired or newly built, both for the Central Office and for forest stations. For the latter, a simple knock-down table has been designed, which can be shipped in a package of about one-fifth the bulk of the same when set up, and is at the same time easily set up at the point of destination. A large part of this work has been done with remnants of lumber, such as from heavy planks resawn for exhibit purposes or long ones cut down to the standard length of 10 feet. With the saw table installed the previous year, the utilization of such scraps is very easy and economical.

WEIGHTS OF WOODS.

A complete table of air-dry weights of all species represented in the collection of 10-foot and 6-foot planks has been prepared. The planks were carefully calipered to the nearest millimeter, at five equidistant points along both edges, for both thickness and width; these measurements were averaged, and the volumes calculated from the averages. From the resulting volumes and the weights of the planks (which were taken to the nearest tenth of a kilogram) was calculated the specific gravity air-dry.

No planks were included that had not been installed at least since the latter part of 1914. The conditions to which they are subject are peculiarly favorable to even and thorough air-drying, the planks being installed on end along the walls (but separated from the walls by an air-space) of a large and very well-ventilated hall. The planks are naturally almost all from large mature trees. It is believed, therefore, that the results, though the material and the methods were somewhat rough, will be applicable to ordinary commercial material more closely than some of the figures previously obtained from small oven-dried specimens, especially as it is known that much of the material on which such figures were based came from small trees.

It is proposed to publish this table of weights as a separate circular during 1918.

CATALOGUE.

In continuation of the work began in 1916 of classifying and rearranging the logs and planks, a similar task has been undertaken with all the minor products. For the first time, they have been completely assorted. Also, incidentally to this, there was commenced in the latter part of 1916 the compilation of an entirely new catalogue, which is intended to include everything in the collections except the logs and planks. The former are recorded under their "B. F. numbers" (Bureau of Forestry herbarium series), while the latter are recorded, as a matter of convenience, in an entirely separate register. The new catalogue has progressed to about 700 numbers, distributed as follows: Almaciga, 81 specimens; barks, tan and dye, 30; bamboos, 66; barks, medicinal, spice, etc., 20; bast fibers, 31; beeswax, 24; gutta-percha, 52; palm products (leaves, fibers, etc.), 29; rattans, 205; resins, pili and allied, 27; resins, dipterocarp, 42; resins and oils, miscellaneous, 18; rubber, 35; vines, miscellaneous, 36. There remain to be classified and recorded: miscellaneous wood specimens other than the regular "museum logs" and planks, manufactured articles of wood, tools and implements, seeds and fruits, fungi, and mineral specimens, all of which, besides such new accessions as may arrive, it is hoped to finish recording during 1918. It is intended, when this work is completed, to publish a complete catalogue of the collections, with notes on uses, distribution, abundance, etc., of the various products.

REVISION OF GROUPS OF TIMBER TREES.

During the year, there has been worked out a complete revision of the first, second, and third groups of timber, which, however, has not yet been put into effect under article 1821 of the Admi-

nistrative Code. It will probably be promulgated during 1918. The list as it stands at present is given in Appendix B. There is no doubt that, as a whole, it will be proposed in its present form, but the progress of our botanical knowledge of the forest flora is so rapid that it is quite probable there may still be some minor additions and changes in nomenclature to the list as it now stands. The last regrouping was put in force about 15 years ago.

SHIPBUILDING.

As noted in the annual report for 1916, calling attention to the opportunities for lumber schooners, the undersigned is very glad to state that during the past year, shipbuilding has really gotten a foothold and is being pushed. The undersigned, as Director of this Bureau, was appointed chairman of the shipbuilding committee under the Food Commission appointed by the Governor-General and the Bureau has done much toward fomenting the building of ships throughout the Islands. At the present time, there are six establishments building schooners for auxiliary power. Several small vessels were launched during the year and a 300-ton schooner was recently launched in southern Negros. The shipyards at Bolinao, Pangasinan, have over three hundred men working in the woods, getting out ship timbers, and some 250 men working in the shipyards. All of these men are Filipinos and are being trained by Captain Hennings, who is in charge of this operation. Enough timber has been gotten out and is seasoning to build at least 10 ships from 300 tons upward, and it is expected that during this coming year these shipyards will be in a position to turn out 12 ships of over 250 tons.

The Bureau of Forestry has aided shipbuilders as much as possible in the granting of licenses and has favored licensees aiding the shipbuilding industry. Shipbuilders in Manila have made use of the Bureau in obtaining timber for their ships through licensees. As one example of such coöperation; the Bureau has sent out to forest stations and to numerous licensees in certain regions a set of blueprints showing the form and dimensions of all the crooks or knees needed for vessels of a certain type. The undersigned feels that the Bureau of Forestry has done its share toward creating at least an inter-island fleet.

So far, no very large boats have been attempted, the largest under construction being one of less than six hundred tons, but plans are under way for the building of six 3,000-ton schooners for use between the west coast of the United States and the

Philippines. It is hoped that the next annual report will give notice of the completion of these boats.

If the shipbuilding industry prospers, as it now seems to promise, this will prove a great stimulus to the lumber industry, not only directly by the increased consumption of lumber for building the ships, but also indirectly, and perhaps in even greater measure, by facilitating the exportation of lumber to foreign countries. As noted in another part of this report, the decrease in exports during the past year, especially to China, has been due entirely to the lack of shipping facilities.

The finest timber in the world can be found in the Philippine Islands for wooden ships. What was in its time the largest frigate in the Spanish Navy was built here by the Spaniards and Philippine timbers are held in very high regard not only in Spain, but along the China coast. For shipbuilding, men are available and can be trained, as has been demonstrated by Captain Hennings at Bolinao, but it is necessary that the Government take some action to facilitate the obtaining of equipment, such as engines, rigging, and hardware. These are not manufactured in the Philippines, and it is very hard for individual shipbuilders to obtain them from the United States.

ADMINISTRATIVE DIVISION.

Allusions have already been made to the work of this division and as the duties of a chief clerk are well known, only the special features of the work will be considered.

GENERAL SERVICE.

The routing of correspondence has been studied with the viewpoint of accuracy and promptness and a system instituted whereby the lack of clerks is partially overcome.

ACCOUNTING.

The changes in the accounting system inaugurated by the Bureau of Audits were adopted without confusion and with an increase of efficiency. Expense accounts are handled promptly in spite of their having to be sent through four persons before final approval.

PROPERTY

The property has been handled efficiently and such equipment as was no longer needed was transferred to other branches of the Government. Unserviceable property received from the forest stations has been repaired or condemned. Owing to the

impossibility of securing certain articles from the United States, substitutes were made at a great saving by employees of the Bureau.

LIBRARY AND TRANSLATING.

New books, catalogues and trade journals are properly filed upon receipt, forestry items in local papers are clipped, and notes for the Quarterly Newsletter are gathered. Letters written in Spanish or in Philippine dialects are translated and answers prepared.

STATISTICS.

Owing to the lack of personnel, the gathering of statistics has been limited to those records needed by the accounting and property sections. During 1918, a complete record of forest statistics will be kept. In the past, these records were obtained from the Bureau of Internal Revenue.

CLASSIFICATION OF WORK.

The time spent upon different kinds of work by rangers and scalers in the division of forest management, forest lands and maps, and sawmills and utilization are shown in the accompanying table.

Nearly the same amount of time was spent upon public land classification work as before, but there was a great increase in the number of public land parcels inspected.

There has been a decrease in time spent on botanical work, chiefly because the rangers on homestead and ordinary license work have already collected most of the trees that are accessible.

FOREST CHARGES.

The trees of the Philippines are divided into four groups. Those of each group are sold at different rates.

Timber.

	Per cubic meter.
First-group trees	₱2.50
Second-group trees	1.50
Third-group trees	1.00
Fourth-group trees	.50

When ebony and camagon from which the sapwood has been stripped are presented for measurement and appraisal, there is collected on each cubic meter of ebony ₱6, and on each cubic meter of camagon ₱4.50.

Table showing number of days and cost of each class of work performed by the field force of the divisions of forest management and forest lands and maps during the fiscal year 1917.

District.	Licenses.				Public lands.				Caiñgins.				Communal forests.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.
No. 1	747	38.45	₱2,971	37.49	515	26.49	₱2,243	28.26	57	2.94	₱283	3.58	44	2.27	₱176	2.28
No. 2	365	41.42	1,329	40.55	279	31.63	1,205	36.79	18	2.04	78	2.38	34	3.84	124	3.78
No. 3	696	27.28	1,600	40.67	58	2.27	185	4.70	99	3.88	134	3.40	8	.32	27	.69
No. 4	785	29.24	2,514	29.28	1,205	44.90	4,035	47.02	61	2.27	258	3.02	109	4.06	342	3.97
No. 5	1,406	34.74	4,393	30.03	1,090	26.93	3,671	25.08	263	6.49	968	6.61	49	1.22	132	.90
No. 6	963	35.92	2,976	35.90	712	26.56	2,216	26.74	187	6.98	637	7.68	78	2.91	263	3.18
No. 7	2,190	43.58	6,157	42.20	1,322	26.30	4,101	28.10	334	6.64	1,096	7.51	89	1.77	261	1.79
No. 8	3,262	55.53	13,152	58.06	1,397	23.77	5,293	23.36	120	2.05	524	2.31	50	.85	301	1.33
No. 9	331	32.44	1,063	30.56	426	41.75	1,622	46.63	96	9.40	345	9.92				
No. 10	1,558	42.12	4,224	38.36	711	19.23	2,302	20.90	358	9.69	1,211	10.99	261	7.05	825	7.49
No. 11	2,361	57.09	6,270	55.46	452	10.92	1,507	13.33	84	2.03	295	2.60	41	.99	123	1.09
No. 12	300	24.93	802	21.87	443	36.83	1,499	40.87	83	6.90	274	7.48	10	.84	42	1.14
No. 13	142	25.95	560	25.99	124	22.66	483	22.42	27	4.94	158	7.34	6	1.10	32	1.48
No. 14	638	43.87	1,911	43.73	245	16.85	799	18.28	57	3.93	201	4.60	104	7.15	326	7.46
Total	15,744	41.71	49,922	41.65	8,979	23.79	31,161	25.99	1,844	4.90	6,462	5.39	883	2.35	2,974	2.48

Table showing number of days and cost of each class of work performed by the field force of the divisions of forest management and forest lands and maps during the fiscal year 1917—Continued.

District.	Botanical collections.				Sundays and Holidays.				Leave.				Reconnaissance.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.
No. 1	20	1.02	₱98	1.24	184	9.46	₱563	7.10	164	8.43	₱430	5.42	62	3.18	₱436	5.50
No. 2	9	1.02	39	1.19	111	12.56	311	9.49	57	6.47	152	4.63				
No. 3	8	.33	7	.19	162	6.35	329	8.36	50	1.97	126	3.20				
No. 4	25	.94	93	1.08	380	14.15	1,008	11.74	95	3.54	261	3.04				
No. 5	5	.13	13	.09	541	13.36	1,647	11.26	325	8.04	868	5.94	173	4.27	472	3.23
No. 6	15	.56	38	.45	354	13.29	841	10.15	139	5.18	312	3.77				
No. 7	11	.22	57	.40	656	13.07	1,457	9.98	208	4.14	447	3.07				
No. 8	49	.83	199	.88	763	12.99	2,661	11.74	234	3.98	524	2.32				
No. 9	5	.48	12	.35	118	11.55	280	8.04	36	3.61	86	2.48				
No. 10	14	.38	45	.41	468	12.66	1,076	9.78	170	4.59	379	3.45	65	1.75	360	3.27
No. 11	27	.65	89	.78	458	11.07	1,037	9.17	435	10.51	915	8.09				
No. 12	3	.25	8	.22	161	13.39	414	11.28	142	11.81	411	11.20				
No. 13	3	.55	11	.52	76	13.90	262	12.16	36	6.59	127	5.90	3	.55	9	.42
No. 14	1	.07	2	.06	202	13.89	469	10.73	59	4.05	143	3.28				
Total	195	.52	711	.60	4,634	12.24	12,355	10.30	2,150	5.69	5,131	4,32	303	.81	1,277	1.07

District.	Nurseries.				Patrol trail and trail building				Miscellaneous.				Travel.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.	Number.	Percent.	Amount.	Percent.
No. 1									136	6.99	₱571	7.20	15	.77	₱155	1.95
No. 2									9	1.02	39	1.19				
No. 3	52	2.04	₱120	3.05	1,209	47.39	₱1,016	25.82	208	8.14	377	9.58	1	.04	13	.34
No. 4									12	.45	35	.40	12	.45	38	.45
No. 5									188	4.65	2,413	16.49	7	.17	55	.37
No. 6									202	7.53	824	9.95	31	1.15	181	2.18
No. 7	17	.34	86	.59					175	3.48	698	4.78	23	.46	230	1.58
No. 8																
No. 9	1	.09	2	.06									7	.68	68	1.96
No. 10	2	.05	7	.07					58	1.56	253	2.29	34	.92	330	2.99
No. 11	12	.29	42	.38	17	.41	138	1.23	187	4.52	577	5.10	63	1.52	312	2.77
No. 12									57	4.72	184	5.02	4	.33	34	.92
No. 13	6	1.10	24	1.12					124	22.66	488	22.65				
No. 14					22	1.52	28	.65	122	8.39	473	10.82	4	.28	17	.39
Total	89	.24	281	.23	1,248	3.30	1,182	.99	1,478	3.91	6,932	5.78	201	.54	1,433	1.20

SUMMARY.

District.	Total days.	Total cost.	District.	Total days.	Total cost.
No. 1	1,944	₱7,926	No. 8	5,875	₱22,654
No. 2	881	3,277	No. 9	1,020	3,479
No. 3	2,551	3,934	No. 10	3,699	11,012
No. 4	2,684	8,584	No. 11	4,137	11,304
No. 5	4,047	14,632	No. 12	1,203	3,668
No. 6	2,681	8,288	No. 13	547	2,154
No. 7	5,025	14,590	No. 14	1,454	4,369
			Total	37,748	119,871

The timber is measured in the round, but in case it has already been squared, a surcharge of 25 per cent is added to cover loss in squaring. If the timber has been manufactured, that is, sawn or roughly fashioned to approximately its finished form, it is considered as being manufactured and a charge of 100 per cent is added. This charge has been found necessary in order to discourage the invoicing of timber after manufacture, as such timber is frequently smuggled out of the forest and sold without any forest charges being paid.

Firewood.

For bacauan and tangal	Per cubic meter	₱0.20
For other woods	do	0.10

Minor forest products.

Clean salago bark	Per 100 kilos	₱6.50
Copal gum (Almaciga)	do	10.00
Gum elemi (brea de Pili)	do	16.00
Gutta-percha (guta-percha)	do	70.00
Diliman	do	10.00
Split rattan (bejuco)	do	10.00
Unsplit rattan (bejuco) 2 centimeters or less in diameter	Per 1,000 linear meters	1.50
Unsplit rattan (bejuco) more than 2 centimeters in diameter	do	3.00
Charcoal (carbon vegetal)	Per cubic meter	4.00
Dyewood (sibucao)	Per 100 kilos	1.50
Dyebark (nigue)	do	5.00
Tanbark (cascalote)	do	3.00
Wood oils (aceite de balao)	Per liter	.10
Gogo bark	Per 100 kilos	20.00

Guano, stone, and earth are secured at special rates, fixed in each case.

All products not enumerated above can be secured without license and free of charge at the present time, but during the past year information has been compiled on many other products upon which, in the opinion of the undersigned, charges should be collected and steps toward this and have already been taken in coöperation with the Bureau of Internal Revenue.

SALE OF FOREST PRODUCTS.

Although the prices of other commodities have arisen, the Government continues to sell its timber, firewood and other forest products at pre-war prices. There has been a gratifying increase in the sum received, namely:

	Timber.	Fire-wood.	Minor products.	Total.
Received in 1917	₱385,083	₱62,044	₱91,199	₱536,326
Received in 1916	373,999	47,998	72,462	494,447
Increase				₱41,879

NEW FOREST REGULATIONS.

The forest regulations issued in 1904 were completely revised to conform with the new Administrative Code and were promulgated on September 11, 1917. They differ slightly in details from the previous regulations. The chief difference is that the duties and responsibilities of licensees are more clearly defined.

The jurisdiction of the Bureau of Forestry over all public land is more clearly defined; there had been previously a tendency to regard tidal swamps and brush areas as agricultural land.

The regulations regarding caiñgins were expanded, as experience has shown that the old regulations did not cover all phases of the subject.

COOPERATION.

The Bureau has continued its former policy of coöperating fully and with every means at its disposal with all other Government Bureaus and with the Army and Navy, as well as with private entities. The many minor affairs in which, directly or indirectly, this office has occasion to coöperate with other Government entities are too numerous to give in detail. A few notable instances along these lines are: Coöperation with the Bureau of Internal Revenue and the Bureau of Agriculture in encouraging and facilitating the construction of tobacco curing sheds; increased and more intimate coöperation with the Bureau of Internal Revenue in the collection of forest charges on timber and minor products; inspection of a great part of the lumber purchased by the U. S. Army Quartermaster Corps from local lumbermen; with the Bureau of Education by putting up educative exhibits of forest products at annual fairs and garden days.

Besides the above, which might be called occasional coöperation, the routine coöperation with the Bureau of Lands in homestead, caiñgin, and other land cases and with the Bureau of Science in the collection of herbarium specimens and material for analyses, has been continued, if not in an increasing ratio, certainly in many respects in a more efficient way than before.

Great progress has been made in coöperation with lumbermen toward establishing complete and adequate grading rules for export lumber. The assistance given to shipbuilding has already been mentioned.

Analogous to the matter of grading rules are the attempts, in coöperation with local collectors and exporting firms, to standardize the methods of collecting minor products and preparing them for shipment. Circulars have been issued to forest stations and to rattan licensees giving instructions regard-

ing the collection and preparation of commercial rattans, while, through the assistance of a large export house, small sample packages of the rattans desired and not desired for the export trade have been sent to all forest stations.

To aid the exporters of almaciga in obtaining better prices for their product, the Bureau has obtained standard samples from Singapore, the greatest minor product market in the world, of the various grade of "Manila copal," with the prices and descriptions of the methods of cleaning and sorting. Portions of these samples have already been loaned to several export firms who desired to try to assort their raw product in a similar manner.

RECOMMENDATIONS.

As already indicated in the discussion of remedies for existing evils, stricter legislation is needed.

1. A law should be passed punishing the illegal occupation of public land. This will remove one of the chief incentives for destroying forests.

This law will also oblige caiñgin makers to vacate the land or else homestead it. At present thousands of parcels of land are claimed by convicted caiñgin makers merely because the occupant is paying taxes on the land.

2. The penalty for the destruction of forests should be increased. At present, the damages collected amount to double the forest charges for the timber destroyed. A recent law in British North Borneo imposes a penalty of up to twenty times the market value of the timber destroyed, while here the penalty amounts to less than 15 per cent of the market value. The actual damages are much greater, as all small trees and seedlings are destroyed and the land, when abandoned, in most cases becomes a cogon covered waste which can only be restored to productive use at great expense.

3. The penalties for evading the payment of forest charges should be made much higher for a second offense. At present, they are only double the regular charges.

As for constructive legislation, the following recommendations are made:

1. *Reforestation.*—The Bureau of Forestry has already demonstrated its ability to carry on reforestation work. There also is no doubt about there being a scarcity of fuel and timber in certain sections of the Philippines. It therefore is recommended that legislation be secured appropriating money for carrying on systematic reforestation on a large scale. There should also be money available to furnish seed to individuals and munic-

ipalities that want to do planting. During the past year many requests for seed were refused simply because no seeds could be purchased.

2. *More forest guards are needed.*—In Java, Japan, British India and elsewhere, guards are employed to a much larger extent than in the Philippines. It will be a distinct economy to employ more guards, who can do some of the work now being performed by rangers. At least fifty additional guards should be employed to protect the forests under present conditions, thus releasing the rangers for other important technical work in line with their training.

3. It is necessary to have more clerks, not only for the Manila office, but also for the forest district headquarters. With the annual increase in the number of rangers and with the present increase in statistical work, it is essential to secure enough men to properly carry on the work. At least four more clerks are needed.

4. The illegal cutting of forest products should be classed as theft and treated as such. A law to this effect is necessary before the general public will regard illegal cutting as being something dishonorable.

5. In order to prevent the loss of revenue due to failure to invoice timber or other products, section 1520 of the Administrative Code should be changed so as to require the payment of forest charges on all forest products cut or gathered, whether removed from the forest or not, before a license will be renewed.

6. A new menace to the lumber industry has appeared. It affects only those who use lakes or sluggish streams for transporting logs. The establishment of water hyacinth (*Eichhornia crassipes*) in many parts of the Philippines, notably in Nueva Ecija, Laguna, Rizal, Camarines, and Mindanao, means that all still water will soon be impassable to rafts of logs, bancas and even steamers.

Legislation is needed providing for the destruction of this pest wherever found.

7. Section 1823 of the Administrative Code should be amended so as to include guards among those employees who are forbidden to have any pecuniary interest in forest products.

8. The digging up of rattan should be penalized by law. Every year thousands of small rattans are dug up for use as whip stocks and canes. Rattan can be had for these purposes without killing the plant and therefore this restriction will work no hardship upon any one, but will prevent the diminution of the supply of rattan.

The needs of the division of investigation and Forest School, which are most urgent are the following:

1. Additional personnel so that the advanced course in the Forest School can be offered.

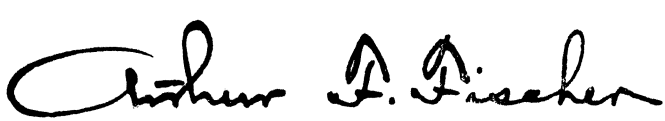
2. *Material equipment.*—There is needed the installation of a lighting system for the cottages and, when possible, the installation of a small power saw for use in the experimental work of the division.

3. There is need of an arrangement by which money received from the sale of products of the plantation and from charges for products on the Makiling Reserve shall be made available for the use of the division of investigation at this place and on the reserve. This matter has been mentioned in previous reports and is increasingly important.

4. As noted under personnel, the demand in the Orient for forest officers having received training in the Philippine service is such that it is a serious problem to retain the men on their present salary. It is recommended that the salaries be placed on the same basis as in other scientific branches of the Government. Otherwise the Government will continually lose the services of trained men and be compelled to employ others who have yet to acquire the experience necessary to deal with the problems presented by local conditions.

5. The amount of per diems now received by rangers is less than the cost of living and it is recommended that they be increased from one peso to ₱1.60 per day.

6. The game law should be so amended as to make it obligatory for hunters in specified region to secure permits from forest officials and, if necessary, to entirely prohibit hunting in certain forests. The enforcement of game and fishing laws should be entrusted to forest officers as well as to other law-enforcing entities, and more stringent legislation should be passed to prevent the destruction of fresh-water fish.



Director of Forestry.

The SECRETARY OF
AGRICULTURE AND NATURAL RESOURCES,
Manila.

APPENDIXES.

APPENDIX A.

GRADING RULES GOVERNING THE INSPECTION AND MEASUREMENT OF PHILIPPINE LUMBER.

For grading Tanguile and the Lauans, Lumbayao, Calantas, Palosapis, Yacal, Guijo, Apitong, Pagatpat and miscellaneous hard woods, the following grades are established and described in these rules:

1. Firsts and seconds.

These two grades are combined and correspond to the highest grade of "export."

2. Export common.
3. Export shorts, chair stock, etc.
4. Sound wormy export.
5. Veneer flitches.
6. Clears.

This corresponds to the highest grade of lumber and dimension timbers as sold in local markets and as exported for other than cabinet purposes.

7. Merchantable.

This grade corresponds to lumber sold in local markets for ordinary house construction, temporary construction, etc., exported for other than cabinet purposes.

8. Culls.

This grade is to include all lumber that will not come up to the grade of Merchantable.

GENERAL INSTRUCTION.

Lumber less than 1 inch in thickness will be graded and measured the same as 1 inch. All lumber shall be graded on the poorer side of the piece.

Bright sap to the extent of one standard defect admitted on boards 10 inches and wider in the grades of firsts and seconds. On boards under 10 inches wide, bright sap admitted in proportion.

No allowances excepting on "splits" shall be made with the object of raising the grade. Splits over 2 feet long, on boards 10 feet and longer, may be marked off.

These rules define the poorest piece admissible in any grade; and each grade shall contain all lumber up to the next higher grade.

STANDARD DIMENSIONS.

Standard thickness are ½ inch, ⅝ inch, ¾ inch, 1 inch, 1¼ inches, 1½ inches, 2 inches, 2½ inches, 3 inches, and 4 inches.

Standard widths are 3 inches, 4 inches, 6 inches, 8 inches, 10 inches, and 12 inches.

Standard lengths are 6 feet, 8 feet, 10 feet, 12 feet, 14 feet, 16 feet, 18 feet, 20 feet, 22 feet, and 24 feet.

Thickness for surfaced lumber, when not otherwise specified, should be as follows:

½-inch rough surfaced two sides should be $\frac{5}{16}$ inch.

⅝-inch rough surfaced two sides should be $\frac{7}{16}$ inch.

¾-inch rough surfaced two sides should be $\frac{9}{16}$ inch.

1-inch rough surfaced two sides should be $\frac{13}{16}$ inch.

1¼-inch rough surfaced two sides should be $1\frac{3}{32}$ inches.

1½-inch rough surfaced two sides should be $1\frac{11}{32}$ inches.

2-inch rough surfaced two sides should be 1¾ inches.

For any thickness over 2 inches an allowance of ¼ inch should be made for surfacing.

Pieces more than ¼ inch less than the standard widths must be tallied down to the next standard width. These dimensions apply to all grades, excepting firsts and seconds and export common, in which all odd widths and lengths will be admitted.

Pieces with a greater variation in thickness than these rules allow shall be graded and tallied as mis-sawn.

DEFECTS.

Each of the following shall be known as a standard defect:

One sound 1½-inch knot.

Two or more smaller knots not exceeding in extent of damage one 1½-inch knot.

One straight split over 6 inches long, but not to exceed 24 inches long.

A "straight split" is defined as one that does not diverge by more than 2 inches per foot from a line parallel to the edge.

Splits over 24 inches long shall be trimmed off.

Grub holes, knot holes, pitch pockets, shake, wane, and any other defects not exceeding in extent of damage one 1½-inch knot.

One inch of bright sap on one edge or its equivalent on both edges or on one or both ends.

The extent of the damage caused by rot, dry-rot, doty heart, shake and heart cracks is difficult to define exactly and inspectors must be very careful in estimating the damage as compared with standard defects.

Sound superficial burls having the appearance of a knot are not to be considered as defects.

1. FIRSTS.

Firsts shall be 8 inches and over wide, 10 feet and over long, and shall be free of all defects, excepting pinholes not visible in the rough, and excepting that pieces containing 10 feet surface measure and over may have one standard defect or its equivalent. One quarter inch variation allowed in thickness, provided no single piece is more than ⅛ inch under standard rough thickness. This grade will admit not more than 5 per cent with this variation.

2. SECONDS.

Seconds shall be 6 inches and over wide, 8 feet and over long, admitting pinholes not visible in the rough and other defects according to surface measure as follows: Six feet, one standard defect; 9 feet, two defects; 13 feet, three defects; 18 feet and over, four defects. Variation in sawing as in firsts.

3. EXPORT COMMON.

Shall be 4 inches and over wide, 6 feet and over long. Variations in sawing as in "firsts." Pinholes visible in the rough not admitted.

Pieces 4 inches and 5 inches wide up to 10 feet long must work 66⅔ per cent clear in not over two pieces; 11 feet and over long must work 66⅔ per cent clear in not over three pieces, in both cases the full width of the piece. Boards 6 inches and over wide must work 66⅔ per cent clear. No cutting considered that contains less than one board foot.

4. EXPORT CHAIRSTOCK, SHORTS, ETC.

Shall be 2 inches and wider, one foot to six feet long. Shall be free from pinholes visible in the rough.

Pieces containing up to two board feet must be clear. Pieces containing over two board feet will admit one standard defect. Variation in sawing as in firsts.

5. SOUND WORMY EXPORT.

Shall grade strictly as first and seconds, but admitting pinholes, excepting boards having black streaks, stained pinholes, or pinholes running parallel with the face. One quarter inch variation allowed in thickness, provided no single piece is more

than ⅛ inch under standard rough thickness and admitting not more than 10 per cent with this variation.

6. VENEER FLITCHES.

Flitches to be from 10 feet to 24 feet long, to be sawn as large as is consistent with good quality, and to show figure on two faces, figure showing on not less than 75 per cent of the face.

Shall be free from pinholes visible in the rough, shake, heart and rot, but will allow defects according to sizes as follows:

Pieces up to 9 by 9 inches must be clear.

Pieces larger than 9 by 9 inches up to 12 by 12 inches will admit 1½-inch of sap on one corner, or one standard defect.

Pieces larger than 12 by 12 inches will admit 2 inches of sap on one corner, or one standard defect and one straight split in one end not exceeding in length the width of the piece, or the equivalent at both ends.

Splits diverging from a line parallel to edge by more than 2 inches to the lineal foot must be cut off. White lauan flitches must be free of sap, otherwise should grade as other veneer flitches.

7. CLEARS.

Clears shall be sound lumber, well manufactured and free of rot, unsound knots, shake, splits, dry-rot or other defects impairing the strength of the piece. Pinholes not considered a defect unless so numerous as seriously to affect the strength of the piece.

Variations in sawing in "clears" will be admitted as follows:

Up to 4 inches thickness, ¼ inch allowed, provided no piece is more than ⅛ inch under standard rough thickness.

Over 6 inches in thickness, ½ inch allowed, provided that no piece is more than ¼ inch under standard rough thickness. This grade will admit not more than 10 per cent with this variation.

Slightly stained sap that will be removed when surfaced to the standard surfaced thickness of the respective dimensions shall not be considered a defect in clears.

Defects admitted as follows:

(*a*) Pieces 1 inch thick up to 7 inches wide and up to 16 feet long shall be clear; over 16 feet long will admit one standard defect, or bright sap not to exceed one-fifth the surface measure of the piece.

(*b*) Pieces 1 inch thick from 8 inches to 12 inches wide, 6 feet and 8 feet long will admit bright sap not to exceed one-fifth surface measure of the piece; pieces 10 and 12 feet long

will admit one standard defect or bright sap not to exceed one-fifth surface measure of the piece; pieces 14 feet and 16 feet long will admit two standard defects, or bright sap not to exceed one-fifth the surface measure of the piece; over 16 feet long, three standard defects, or bright sap not to exceed one-fifth the surface measure of the piece.

(*c*) Pieces 1 inch thick over 12 inches wide and 6 and 8 feet long will admit one standard defect or bright sap not to exceed one-fifth the surface measure of the piece; pieces 10 and 12 feet long will admit two standard defects or bright sap not to exceed one-fifth the surface measure of the piece; pieces 14 and 16 feet long will admit three standard defects or bright sap along one or both edges equivalent in the aggregate to four standard defects if there are no other defects; over 16 feet long will admit four standard defects.

(*d*) Pieces 1½ to 2½ inches thick up to 7 inches wide and up to 16 feet long must be clear; over 16 feet long will admit one standard defect or bright sap not to exceed one-fifth surface measure of the piece.

(*e*) Pieces 1½ to 2½ inches thick, 8 to 12 inches wide up to 12 feet long will admit one standard defect or bright sap not to exceed one-fifth the surface measure of the piece; pieces 14 and 16 feet long will admit two standard defects, or bright sap not to exceed one-fifth the surface measure of the piece; over 16 feet long, three standard defects.

(*f*) Pieces 3 to 4 inches thick up to 7 inches wide up to 12 feet long must be clear; pieces 14 and 16 feet long will admit one standard defect or bright sap not to exceed one-fifth surface measure of the piece; over 16 feet long, two standard defects or bright sap not to exceed one-fifth surface measure of the piece.

(*g*) Pieces 3 to 4 inches thick, 8 to 12 inches wide up to 12 feet long will admit one standard defect or bright sap not to exceed ⅕ of the surface measure of the piece; pieces 14 and 16 feet long will admit two standard defects or bright sap not to exceed ⅕ of the surface measure of the piece; over 16 feet long, three standard defects, or bright sap not to exceed ⅕ of the surface measure of the piece.

(*h*) Pieces 6 by 6 inches, not over 9 by 9 inches, up to 16 feet long, will admit two standard defects; over 16 feet long, three standard defects. Boxed heart not admitted.

(*i*) Pieces upward of 9 by 9 inches, up to 16 feet long will admit three standard defects; over 16 feet long, four standard defects. Boxed heart not admitted.

8. MERCHANTABLE.

Variations in sawing same as in clears. Sound stained sap not considered a defect in this grade.

Up to 4 inches in thickness, this grade will admit all sound lumber that does not contain defects seriously impairing the strength of the piece for ordinary or temporary structural purposes; will also admit wane on one edge not to exceed half the thickness of the piece nor extending over more than half the length, nor to exceed one-fourth the with of the face.

Timbers from 6 by 6 inches upward, this grade will admit: boxed heart, provided heart cracks do not extend to more than one face; also sun checks, pitch pockets, slight shakes or heart cracks, sound sap, knots, or other defects not seriously effecting the strength of the piece; and wane not to exceed one fourth the width of any face, nor extending over more than half the length of the piece.

Pieces containing more sap than heart wood shall be excluded from this grade.

APPENDIX B.

REVISED GROUPING.

FIRST GROUP. (22 woods).

Acle (*Albizzia acle* Merr.).
Aranga (*Homalium*, all species).
Bansalagin (*Mimusops elengi* L., *M. parvifolia* R. Br.).
Baticulin (*Dehaasia* spp., *Litsea euphlebia* Merr., *L. fulva* F.-Vill., *L. obtusata* F.-Vill., *L. philippinensis* Merr., *Machilus* spp., *Nothophoebe malabunga* Merr., *Phoebe sterculioides* Merr., all woods of the family Lauraceae having soft, fine-grained, golden yellow wood with more or less characteristic odor).
Batitinan (*Lagerstroemia piriformis* Koehne).
Betis (*Bassia betis* Merr.).
Calantas (*Toona calantas* Merr. & Rolfe and all other species).
Camagon (*Diospyros discolor* Willd., and other species having characteristic reddish sapwood and black or streaky heartwood).
Duyokduyok (*Mimusops calophyloides* Merr.).
Ebony (*Maba buxifolia* Pers.).
Gisok (*Shorea astylosa* Foxw., *S. balangeran* Dyer, and other species with wood of Yacal type).
Ipil (*Intsia acuminata* Merr., *I. bijuga* Ktze.).
Mancono (*Xanthostemon verdugonianus* Naves).
Molave (*Vitex celebica* Koord., *V. parviflora* Juss., *V. pubescens* Vahl, and any other species producing characteristic dense, hard wood).
Narra (*Pterocarpus*, all species).
Sasalit (*Vitex aherniana* Merr.).
Supa (*Sindora supa* Merr.).
Tambulian (*Eusideroxylon zwageri* T. & B.).
Teak (*Tectona grandis* L. f.).
Tindalo (*Pahudia rhomboidea* Prain).
Urung (*Fagraea fragrans* Roxb.).
Yacal (*Hopea basilanica* Foxw., *H. mindanaensis* Foxw., *H. ovalifolia* Boerl., *H. philippinensis* Dyer, *H. plagata* Vid., *Isoptera borneensis* Scheff., and other species with wood of the Yacal type.

SECOND GROUP (34 woods).

Acleng-parang (*Albizzia procera* Benth.).
Alintatau (*Neonauclea* sp.).
Alupag (*Euphorbia cinerea* Radlk., *E. gracilis* Radlk.).
Alupag-amo (*Litchi philippinensis* Radlk.).
Anubing (*Artocarpus cumingiana* Trécul., *A. lamellosa* Blco., *A. lanceolata* Trécul., *A. rubrovenia* Warb., *A. subrotundifolia* Elm., *A. superba* Becc., and other species with small, entire leaves, except Nangka, *Artocarpus integra* Merr.)
Banaba (*Lagerstroemia speciosa* Pers.).

Banuyo (*Wallaceodendron celebicum* Koord.).
Bolong-eta (*Diospyros pilosanthera* Blco.).
Bulala (*Nephelium mutabile* Bl.).
Calamansanay (*Neonauclea*, all species except *N. bernardoi* Merr.).
Caña-fistula (*Cassia javanica* L.).
Catmon (*Dillenia*, all species).
Dirigkalin (*Xanthostemon bracteatus* Merr.).
Guijo (*Shorea guiso* Bl.).
Kayu-galu (*Sindora inermis* Merr.).
Macaasim (*Eugenia*, all species large enough to furnish saw timber).
Malabayabas (*Tristania decorticata* Merr. and other species.)
Malacadios (*Beilschmiedia cairocan* Vid., and other species).
Malugay (*Pometia pinnata* Forst.).
Mangachapuy (*Hopea acuminata* Merr., *H. pierrei* Hance, and other species with wood of Mangachapuy type).
Manggis (*Koompassia excelsa* Taub.).
Mapilig (*Xanthostemon* sp.).
Maranggo (*Azadirachta integrifoliola* Merr.).
Narek (*Balanocarpus cagayanensis* Foxw., and *B. brachyptera* Foxw.).
Narig (*Vatica mangachapoi* Blco, and all other species).
Palomaria (*Calophyllum*, all species).
Salingkugi (*Albizzia saponaria* Bl.).
Sudiang (*Ctenolophon philippinensis* Hall. f.).
Taba (*Tristania littoralis* Merr.).
Tabau (*Lumnitzera littorea* Voigt., *L. racemosa* Willd.).
Tamayuan (*Strombosia philippinensis* Rolfe).
Tanglin (*Adenanthera intermedia* Merr.).
Tiga (*Tristania* sp.).
Tucang-calao (*Aglaia clarkii* Merr.).

THIRD GROUP. (49 woods).

Agaru (*Dysoxylum decandrum* Merr., and other spp.).
Agoho (*Casuarina equisetifolia* Forst.).
Agoho del Monte (*Casuarina*, all spp. except above).
Almaciga (*Agathis alba* Foxw.).
Amamanit (*Eucalyptus naudiniana* F. v. Muell.).
Amugis (*Koordersiodendron pinnatum* Merr.).
Anislag (*Securinega flexuosa* Muell.–Arg.).
Antipolo (*Artocarpus communis* Forst., *A. ovatifolia* Merr., *A. treculiana* Elm., and other species with large, incised leaves).
Apitong (*Dipterocarpus*, all species).
Batino (*Alstonia macrophylla* Wall., and all other species, except Dita, *A. scholaris* R. Br.).
Batukanag (*Aglaia bicolor* Merr. and other species, except Tucang-calao, *A. clarkii*, Merr.).
Bayanti (*Aglaia Ilanosiana* C.DC.)
Binggas (*Terminalia comintana* Merr.)
Bulog (*Aglaia everettii* Merr.).
Calumpit (*Terminalia edulis* Blco.).
Dalinsi (*Terminalia pellucida* Presl.).
Dao (*Dracontomelum dao* M. & R.).
Gisihan (*Aglaia laevigata* Merr.).
Kalingag (*Cinnamomum mercadoi* Vid.).
Kamatog (*Erythrophloeum densiflorum* Merr.).

Kansulud (*Aglaia multifoliola* Merr.).
Kato (*Amoora aherniana* Merr.).
Kayatau (*Dysoxylum turczaninowii* C.DC.).
Lanete (*Wrightia*, all species).
Lanutan 1st. (*Bombycidendron*, all species).
Lumbayao (*Tarrietia javanica* Bl.).
Lumbayao-batu (*Tarrietia* sp.).
Malabatino (*Paralstonia clusiacea* Baill., *P. platyphylla* Merr.).
Malakayan (*Shorea plagata* Foxw.).
Malasaging (*Aglaia diffusa* Merr.).
Malasantol (*Sandoricum vidalii* Merr.).
Matamata (*Aglaia elaeagnoides* Benth.).
Mayapis (*Shorea palosapis* Merr.).
Miao (*Dysoxylum euphlebium* Merr.).
Nangka (*Artocarpus integra* Merr.).
Nato (*Palaquium*, all species).
Oak (*Quercus*, all species large enough to furnish sawtimber).
Pagatpat (*Sonneratia pagatpat* Blco.).
Palosapis (*Anisoptera*, all species).
Piagao (*Xylocarpus moluccensis* M. Roem.).
Pine (*Pinus insularis* Endl. and *P. merkusii* Jungh. & de Vr.).
Red Lauan (*Shorea negrosensis* Foxw. and other species with wood of same type).
Sacat (*Terminalia nitens* Presl.).
Salamungi (*Aglaia turczaninowii* C.DC.).
Santol (*Sandoricum koetjape* Merr.).
Tabigi (*Xylocarpus granatum* Koen.).
Talisay (*Terminalia catappa* L.).
Talisay-gubat (*Terminalia oöcarpa* Merr.).
Tiaong (*Shorea teysmanniana* Dyer).
Toog (*Petersianthus quadrialatus* Merr.).
Unik (*Albizzia marginata* Merr.).
Yacal (*Shorea polysperma* Merr.)

APPENDIX C.—STATISTICAL TABLES.

TABLE NO. 1.—*Statement of the public lands application received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value.*

Provinces.	Received from the Bureau of Lands.							Certification made to the Bureau of Lands.							Returned to Bureau of Lands uncertified during the year 1917.				Total pending inspection December 31, 1917.			
	Pending from previous years.			During the year 1917.				Agriculture.			Forestry.											
	H.	P.	L.	H.	P.	L.	Total.	H.	P.	L.	H.	P.	L.	Total.	H.	P.	L.	Total.	H.	P.	L.	Total.
Abra	6	2		21	2		31	18	3		1			22					8	1		9
Agusan	69	9		178	9	4	269	144	13		1			166	3	1	4	8	99	4		103
Albay	9	4		30	10		53	13	8		8			29					18	6		24
Ambos Camarines	150	9		432	6		597	236	7		38	4		289	4			4	304	4		308
Antique	20			26			46	33						33					13			13
Bataan	42	4	1	112	6	3	168	108	4	2	2			119	2		1	3	42	6	1	49
Batanes	3			1	2	1	7	4	2	1				7								
Batangas					1		1		1					1								
Bohol	7	6		15			28	10	5					15					12	1		13
Bukidnon	4			18	4		26	20	4		1			26	1			1				
Bulacan	14	3	1	33	3		54	21	3		1	1	1	28	1			1	24	2		26
Cagayan	71	10		230	18		329	202	15		7			238	8	6		14	84	7		91
Capiz	24			32	4	1	61	17	1		14			32					25	3	1	29
Cavite					2		2		1			1		2								
Cebu	8			14	3		25	14	1		1			17	1			1	6	2		8
Cotabato	44	1	2	377	23	7	454	356	14	3				375	2			2	63	10	6	79
Davao	78	2	9	436	28	56	609	309	14	41	1			374	6	1	2	9	198	15	22	235
Ilocos Norte	13			47	7		67	44	5		2			55	4			4	10	2		12
Ilocos Sur	61	3		216	25		305	187	16		21			224					69	12		81
Iloilo	4			8	6		18	9	5					14					3	1		4
Isabela	89	1		165	5	1	261	158	4		1			166	1	2		3	94		1	95
Laguna	24			21	2		47	35	2		3			40					7			7
Lanao	3	1		92	7	2	105	69	7	2	1			81	2			2	23	1		24
La Union	28	2	1	119	7	2	159	60	2	2	23			87					64	7	1	72
Leyte	260	3		278	25		566	331	16		50	4		419	16	2		18	141	6		147
Mindoro	169	1	1	410	24	5	610	239	10	6	82	1		346	8			8	250	14		264
Misamis	8			46	2		56	45	1					46					9	1		10
Mountain	47	2		67	5	1	122	56	1		10			67					48	6	1	55
Negros Occidental	123	4		362	7	3	499	305	9	2	43		1	378	17	1		18	120	1		121
Negros Oriental	5			6	1		12	5						5					6	1		7
Nueva Ecija	633	23	11	2,204	143	25	3,039	2,074	120	28	98	6		2,373	44		3	47	21	40	5	666
Nueva Vizcaya	16	1		233	44	2	296	172	28	2	1			205	2			2	74	17		91
Palawan	369	2	1	171	4	3	550	415	5	2	20			446	3		1	4	102	1	1	104
Pampanga	7	1		26	1	1	36	20		1	1	2		24					12			12
Pangasinan	317	2	2	530	45	5	901	528	24	5	63		1	628	3	4		7	253	19	1	273

Rizal	11	1	1	41	9	------	63	38	7	1	------	------	------	54	6	2	------	8	8	1	------	9
Samar	47	------	------	45	------	------	92	70	------	------	12	------	------	83	1	------	------	1	9	------	------	9
Sorsogon	33	1	------	108	14	------	156	56	6	------	38	------	------	103	3	------	------	3	44	9	------	53
Sulu	3	------	------	12	2	1	18	15	1	1	------	1	------	18	------	------	------	------	------	------	------	------
Surigao	4	------	------	24	------	------	28	18	------	------	8	------	------	26	------	------	------	------	2	------	------	2
Tarlac	50	3	2	231	24	12	322	244	20	13	2	------	------	279	------	------	------	------	35	7	1	43
Tayabas	207	11	------	786	47	------	1,051	434	24	------	190	4	------	654	2	------	------	2	367	30	------	397
Zambales	58	9	5	179	23	8	282	86	10	2	6	1	------	107	2	------	------	2	143	21	11	175
Zamboanga	59	------	------	479	47	8	593	414	38	4	47	2	3	510	2	------	------	2	75	7	1	83
Total	3,197	121	37	8,861	647	151	13,014	7,632	457	118	797	27	6	9,211	144	19	11	174	3,485	265	53	3,803

Fiscal year—	Homesteads.			Sale applications.			Leases.			Grand total.
	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	
1905	80	6	86	8	------	8	------	------	------	94
1906	318	16	334	20	1	21	1	------	1	356
1907	881	19	900	23	------	23	12	------	12	935
1908	2,456	51	2,507	49	1	50	26	------	26	2,583
1909	1,523	187	1,710	26	3	29	27	------	27	1,766
1910	1,175	385	1,560	34	5	39	42	2	44	1,643
1911	1,528	221	1,749	46	3	49	30	1	30	1,829
1912	2,609	301	2,910	95	11	106	47	1	48	3,064
1913	2,680	269	2,949	104	30	134	47	1	48	3,131
1913 (July 1 to December 31)	1,653	159	1,812	81	16	97	41	3	44	1,953
1914	4,812	685	5,497	279	36	315	77	1	78	5,890
1915	5,965	688	6,653	317	52	369	70	1	71	7,093
1916	6,015	670	6,685	227	18	245	55	4	59	6,989
1917	7,632	797	8,429	457	27	484	118	6	124	9,037
Total	39,327	4,454	43,781	1,766	203	1,969	593	20	613	46,363

SUMMARY.

Applications on hand during 1917		13,014
Certified for Agriculture	8,207	
Certified for Forestry	830	
Returned uncertified	174	
		9,211
Total pending December 31, 1917		3,803

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species, cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1917.*

Species.	Fiscal year—				July 1 to Dec. 31, 1913.
	1910	1911	1912	1913	
Lauan	43,439	46,942	57,036	81,469	20,249
Apitong	20,764	21,096	28,929	32,391	12,905
Tanguile	2,106	2,762	3,999	5,249	3,390
Guijo	14,107	14,231	18,579	17,279	7,841
Yacal	8,225	8,150	14,491	21,770	5,593
Ipil	13,717	12,296	17,237	15,791	7,535
Molave	8,923	7,978	9,091	9,363	4,783
Narra	5,744	4,996	8,474	8,877	3,941
Calantas	3,174	1,368	938	3,320	886
Palosapis					
Mangachapuy					
Dungon	2,453	1,693	1,213	931	601
Tindalo	954	1,018	794	932	484
Acle	809	867	1,295	1,690	729
Other species:					
First group	574	322	707	1,000	687
Second group	6,667	6,644	7,988	8,543	3,266
Third group	8,316	10,927	11,796	8,711	2,999
Fourth group	36,786	41,655	42,981	59,855	25,613
Total	176,758	182,945	225,548	277,171	101,502

Species.	Fiscal year—				Total, 1910 to 1917.
	1914	1915	1916	1917	
Lauan	74,453	73,277	107,634	131,699	636,198
Apitong	32,328	38,849	56,529	55,335	295,126
Tanguile	14,682	15,460	28,961	25,389	101,998
Guijo	19,701	15,650	16,685	16,857	140,930
Yacal	15,115	14,714	16,471	11,963	116,492
Ipil	17,602	12,089	14,147	16,629	127,043
Molave	9,753	10,546	10,788	13,582	84,807
Narra	8,467	9,868	7,970	5,904	64,241
Calantas	2,423	1,999	4,574	7,381	26,063
Palosapis	2,222	1,631	2,723	3,042	9,618
Mangachapuy	1,469	1,859	2,666	2,916	8,910
Dungon	2,199	1,467	1,127	1,592	13,276
Tindalo	914	1,181	1,115	1,145	8,537
Acle	1,287	1,498	1,088	798	10,061
Lumbayao				6,085	6,085
Pagatpat				1,502	1,502
Other species:					
First group	2,196	2,190	3,074	1,084	11,834
Second group	9,373	6,940	7,938	6,432	63,791
Third group	7,557	6,920	5,214	9,895	72,335
Fourth group	73,017	60,130	56,738	47,661	444,436
Total	294,758	276,268	341,442	366,891	2,243,283

TABLE NO. 3.—*Revenues derived from the sale of forest products and expenditures of the Bureau of Forestry since its organization, April 14, 1900.*

Fiscal year—	Revenue.	Expense.	Surplus.	Expense.
				Per cent.
1901 to 1906	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913	390,664	227,048	163,616	59
1913 (July to December 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
1917	536,328	281,126	255,202	53
Total	6,334,482	3,425,884	2,908,598	54.15

TABLE NO. 4.—*Revenue from sale of forest products, January 1 to December 31, 1917.*

Province.	Amount.	Province.	Amount.
Abra	₱1,887.23	Mindoro	₱6,679.16
Agusan	1,643.84	Misamis	4,335.39
Albay	10,066.77	Mountain	5,345.00
Ambos Camarines	22,672.35	Negros Occidental	16,473.68
Antique	500.69	Negros Oriental	3,846.73
Bataan	11,026.26	Nueva Ecija	5,406.75
Batangas	2,907.45	Nueva Vizcaya	346.71
Bohol	2,277.48	Palawan	1,978.44
Bukidnon		Pampanga	1,622.61
Bulacan	8,428.01	Pangasinan	8,495.31
Cagayan	16,352.76	Rizal	3,850.60
Capiz	6,220.35	Samar	6,965.00
Cavite	524.24	Sorsogon	22,307.95
Cebu	3,669.87	Sulu	2,123.48
Cotabato	3,328.13	Surigao	3,341.78
Davao	3,483.36	Tarlac	1,830.58
Ilocos Norte	2,042.17	Tayabas	43,730.50
Ilocos Sur	2,577.25	Zambales	3,578.87
Iloilo	16,140.80	Zamboanga	36,770.63
Isabela	5,343.64		
Laguna	3,670.57	Total charges	487,665.04
La Union	562.81	Total fines and penalties	48,663.13
Lanao	4,556.58		
Leyte	16,104.19	Grand total	536,328.17
Manila	211,312.20		

TABLE NO. 5.—*Timber Licenses in force during fiscal year 1917 (January 1 to December 31, 1917).*

Province.	Timber licenses.					Gratuitous licenses.				Total.
	For less than 100 cubic meters.	For 100 cubic meters and less than 1,000 cubic meters.	For 1,000 cubic meters and over.	License agreements.	Total commercial licenses.	For personal use.		For public works; second and lower group.	Miner's gratuitous licenses.	
						Inside communal forests.	Outside communal forests.			
Abra	56	34	------	------	90	5	18	------	------	23
Albay	9	16	5	------	30	22	7	2	------	31
Ambos Camarines	55	42	3	1	101	29	25	6	21	81
Antique	4	2	------	------	6	------	1	------	------	1
Bataan	25	24	15	1	65	1	1	3	------	5
Batanes	------	------	------	------	------	------	------	------	------	------
Batangas	9	2	------	------	11	------	2	------	------	2
Bohol	12	6	------	------	18	8	45	10	------	63
Bulacan	5	54	------	------	59	2	8	3	7	20
Cagayan	26	78	3	------	107	82	17	8	------	107
Capiz	42	17	------	------	59	16	21	5	------	42
Cavite	------	1	------	------	1	------	------	------	------	------
Cebu	12	4	------	------	16	5	27	2	------	34
Ilocos Norte	50	34	------	------	84	29	------	11	1	41
Ilocos Sur	9	1	------	------	10	13	12	3	------	28
Iloilo	15	10	------	------	25	------	------	------	------	------
Isabela	7	52	------	------	59	34	7	4	------	45
Laguna	32	19	1	------	52	------	22	------	------	22
La Union	4	4	------	------	8	14	------	2	------	16
Leyte	63	44	4	------	111	29	230	5	------	264
Mindoro	11	56	5	------	72	------	84	3	------	87
Misamis	16	8	2	------	26	13	28	1	------	42
Department of Mindanao and Sulu:										
Agusan	10	3	------	------	13	4	41	2	------	47
Bukidnon	------	------	------	------	------	------	------	------	------	------
Cotabato	1	4	6	------	11	------	------	------	------	------
Davao	17	6	1	------	24	------	------	------	------	------
Lanao	8	------	10	1	19	2	------	------	------	------
Sulu	------	3	3	------	6	------	------	3	------	3
Zamboanga	25	10	12	2	49	2	51	6	1	60
Mountain Province	78	8	5	2	93	3	15	12	5	35
Nueva Ecija	22	15	------	------	37	17	20	1	------	38
Nueva Vizcaya	19	4	------	------	23	------	40	2	------	42
Occidental Negros	26	36	1	2	65	9	7	------	------	16
Oriental Negros	14	10	------	------	24	27	14	2	------	43
Palawan	9	14	18	------	41	2	30	3	------	35
Pampanga	3	6	------	------	9	------	------	2	------	2
Pangasinan	56	30	------	------	86	34	12	4	------	50
Rizal	22	11	------	------	33	4	------	1	1	6
Samar	39	24	1	------	64	70	34	2	------	106
Sorsogon	40	52	9	------	101	31	49	7	9	96
Surigao	30	1	3	------	34	9	112	3	2	126
Tarlac	12	1	------	------	13	------	53	1	------	54
Tayabas	42	72	9	1	124	10	16	6	------	32
Zambales	15	11	1	------	27	31	3	1	------	35
All provinces	------	------	------	------	------	------	------	1	------	1
Total	950	829	117	10	1,906	557	1,052	127	47	1,783

NOTE.—Seventy-five licenses are not included in the above figures. These licenses were either canceled or returned. In Cagayan, Isabela, and Nueva Ecija 1,563 licenses were issued for building tobacco curing houses.

TABLE NO. 6.—*Report of utilization of forest products from public forests of the Philippine Islands during the fiscal year 1917 (January 1 to December 31, 1917).*

Province.	Timber.					Firewood class.		Charcoal.	Dyewood.	Tanbark.	Dyebark.
	Group.				Total.						
	First.	Second.	Third.	Fourth.		First.	Second.				
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*
Abra	352	342	111	153	958	139	1,516				
Albay	883	740	1,175	1,185	3,983	3,720	3,645	9		18,996	
Ambos Camarines	1,317	902	6,397	3,483	12,099	14,902	44,372			123,700	9,492
Antique	20	30	43	117	210		40				
Bataan	44	2,878	28,235	12,159	43,316	2,297	17,913	271			
Batangas	49	36	1	63	149		2,385	6		135,487	36
Bohol	107	165	47	661	980	6,526	9,400			16,990	
Bulacan	211	265	383	8,772	9,631	437	1,744	617		34,409	
Cagayan	3,924	1,409	1,783	1,925	9,041	231	6,589			34,505	
Capiz	170	49	544	3,595	4,358	9,322	17,442	222			40
Cavite			4	5	9	5	2,409	16		57,045	93
Cebu	132	38	92	241	503	220	681	64		9,750	1,334
Ilocos Norte	342	298	256	432	1,328	166	258			94	
Ilocos Sur	340	287	182	151	960	58	425			199,965	
Iloilo	95	53	59	526	733	3,038	33,442	314	1,601,026	309,659	
Isabela	1,045	546	541	1,312	3,444		439				
Laguna	9	186	437	2,637	3,269	36	3,175	99		89,530	
La Union	48	50	18	15	131		12			16,621	
Leyte	1,354	555	2,398	4,800	9,107	3,500	3,129	13		4,800	60
Mindanao and Sulu:											
1. Agusan	311	48	16	1	376	191	60				
2. Bukidnon	1				1						
3. Cotabato	3,232	2,852	998	1,493	8,575	227	11,718				
4. Davao	89	27	3	103	222	1,039	480	18			
5. Lanao	230	483	9,733	29,082	39,528	13	862				
6. Sulu	2,129	537		108	2,774	1,665		9		51,882	
7. Zamboanga	4,298	5,109	8,615	19,182	37,204	2,023	1,095	78		866,384	
Mindoro	1,406	4,257	1,548	4,622	11,833	3,371	1,387			210,011	9,709
Misamis	1,074	265	222	998	2,559	80	196			2,574	
Mountain Province	319	180	44	6,668	7,211		6,764			33,386	
Negros Occidental	763	829	21,011	67,791	90,394	17,879	15,578	139		3,720	
Negros Oriental	262	210	178	509	1,159	177	1,673			465	
Nueva Ecija	545	354	46	429	1,374		891	19		45,943	
Nueva Viscaya	104	79	16	1	200		475				
Palawan	13,765	4,297		32	18,094	1,132	31			242,993	28,863
Pampanga	3	22	237	372	634	664	6,612	426		3,844	
Pangasinan	1,224	1,211	714	1,725	4,874	3,655	2,483	22		107,666	
Rizal	21	31	58	561	671	320	13,508	158		35,110	1,911

TABLE No. 6.—*Report of utilization of forest products from public forests of the Philippine Islands during the fiscal year 1917 (January 1 to December 31, 1917)*—Continued.

Province.	Timber.					Firewood class.		Charcoal.	Dyewood.	Tanbark.	Dyebark.
	Group.				Total.						
	First.	Second.	Third.	Fourth.		First.	Second.				
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*
Samar	318	834	573	1,024	2,749	2,131	26			80,918	
Sorsogon	3,398	2,037	1,035	5,549	12,014	11,299	25,072	7		91,820	9,859
Surigao	397	143	132	412	1,084	2,167	80	11		43,187	
Tarlac	120	31	25	84	260	5	4,040	35		26,805	
Tayabas	6,324	2,411	5,085	3,875	17,695	34,989	31,325	437		250,228	19,127
Zambalez	335	102	666	94	1,197	2,849	3,872	50		17,700	3,840
Total	51,105	35,178	93,661	186,947	366,891	130,472	277,224	3,040	1,601,026	3,165,687	84,364

Province.	Wood oils.	Gum mastic.	Pitch.	Gutta-percha.	Split rattan.	Unsplit rattan.		Diliman.	Stone.	Lime stone.	Gogo.	Salago bark.
						Over 2 cm. diameter.	2 cm. diameter or less.					
	Liters.	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Lin. m.*	*Lin. m.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
Abra							162,223			3,833		
Albay		6,597			79,899							1,113
Ambos Camarines		153,434	1,562		861,144	336,968	796,618	784		2,000		
Antique					7,623			2,629				
Bataan					79,738	67,560	383,000	1,886			8,290	
Batangas					475						14,833	
Bohol	60				2,608		4,854	127			9	
Bulacan			473		27,465		32,980				147	
Cagayan	150	76,852			380,113	94,068	279,160	1,890				
Capiz	5,582	8,257			5,960	45	2,162	460			242	
Cavite											411	
Cebu	293				4,584						14	
Ilocos Norte					766		721			36,475	10	
Ilocos Sur					319		27,700		54,341	102,036		
Iloilo					13,440		3,000	20		1,380		
Isabela					5	34,624	77,060					
Laguna		539			40,835	40,008	3,032	3,238			864	
La Union											843	
Leyte	4,436				46,807	83,311	188,529	5,399	194		90	

Mindanao and Sulu:												
1. Agusan		54			83,983	2,280	29,025					
2. Bukidnon				503	46,653							
3. Cotabato				6,155	3,328							
4. Davao		438,664			4,055							
5. Lanao		545		13,665	590	1,000	400					
6. Sulu		6,800			1,831							
7. Zamboanga		4,984	27	5,960	31,486		5,125					
Mindoro					54,753	45,050	159,409	50,301				
Misamis	400	331			35,868		1,330					
Mountain					126,219					226,358		
Negros Occidental	2,069		48		418,656	540		9,756				
Negros Oriental	38,468				197,368	974	5,852	248			2,836	
Nueva Ecija					88,402	96,938	173,080	680			87,361	
Nueva Vizcaya												
Palawan	306	40,220			10,911		1,078,194	290			35,352	
Pampanga					953		42,500	700			169	
Pangasinan		282			1,012	3,620	117,000	420			251	
Rizal					75,586	2,102	1,500				3,431	
Samar	1,171				182,828		3,600	978				
Sorsogon	665	454	181		812,590			3,600			3,642	
Surigao	480	129			95,898	6,789	18,630					
Tarlac					6,883		108,445	2,028			20,723	
Tayabas		57,769	107,095		766,575	1,948,596	7,461,765	3,356	532		1,060	
Zambales					8,101	60,000	2,301,370					
Total	54,080	795,911	109,386	26,283	4,606,310	2,824,473	13,468,264	88,790	55,067	372,082	201,155	1,113

TABLE No. 6–b.—*Statement of forest products, cut or gathered from re gistered private woodlands during fiscal year 1917.*

Province.	Timber.					Fire-wood.	Char-coal.	Tan-bark.	Gogo.	Dye-bark.	Rattan.			White earth balls.
	First group.	Second group.	Third group.	Fourth group.	Total.						Split.	Unsplit.	Diliman.	
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Lin. m.*	*Kilos.*	
Albay						404								
Bataan		2	3	10	15	1,543	50						2,515	
Batangas	18	402	42	87	554	15,644		56,315		4,599				
Bulacan						10,024								
Capiz	1				1									
Cavite						3,156	560							
Cebu						33								
Ilocos Norte		21	19		40									
Iloilo						894								
Isabela	3				3									
Laguna			17	423	440	6,346	2,318	12,716			41			14,291
Mindoro	4	3			7									
Negros Occidental	102	69	315	298	784	8,270			84		120			
Nueva Ecija	178	120	11	317	626	483		933	1,493		1,203			
Palawan				1	1									
Pampanga		69	195	278	542	40,349	160							
Rizal	17	1		145	163	11,050	295	2,100						
Sorsogon				39	39									
Tarlac	3	4	18		25	15,456	40	5,500	114			94,850		
Total	326	691	625	1,598	3,240	111,652	3,423	77,564	1,691	4,599	1,364	94,850	2,515	14,291

TABLE NO. 7.—*Minor product licenses in force during fiscal year 1917 (January 1 to December 31, 1917).*

Province.	Firewood.	Charcoal.	Dyewood.	Tanbarks and dyebark.	Wood oils.	Almaciga, resins, and others.	Gutta-percha.	Bejuco and diliman.	Gogo.	Others.	Total.
Abra	19	----	----	1	----	----	----	17	----	1	38
Albay	29	----	----	3	----	----	----	26	----	3	61
Ambos Camarines	77	1	----	7	----	26	----	172	2	2	287
Antique	----	----	----	----	----	----	----	17	----	----	17
Bataan	41	10	----	----	----	2	----	71	12	----	136
Batanes	----	----	----	----	----	----	----	----	----	----	----
Batangas	7	----	----	5	----	----	----	----	----	----	12
Bohol	21	----	----	----	----	----	----	----	----	----	21
Bulacan	7	9	----	----	----	3	----	20	2	----	41
Cagayan	38	----	----	3	1	27	----	84	----	3	156
Capiz	46	2	----	----	----	7	----	20	1	5	81
Cavite	5	----	----	1	----	----	----	----	----	----	6
Cebu	8	3	----	----	----	----	----	1	----	----	12
Ilocos Norte	13	----	----	----	----	----	----	3	----	4	20
Ilocos Sur	7	1	----	1	----	----	----	1	----	19	29
Iloilo	92	10	21	10	----	1	----	9	----	9	152
Isabela	5	----	----	----	----	1	----	15	----	----	21
Laguna	10	1	----	----	----	1	----	30	8	1	51
La Union	2	----	----	----	----	----	----	----	----	----	2
Leyte	45	3	----	----	----	1	----	46	----	25	120
Mindoro	36	3	----	25	----	----	----	57	15	----	136
Misamis	5	----	----	1	----	2	4	14	----	----	26
Department of Mindanao and Sulu:											
Agusan	5	----	----	----	----	----	----	23	----	----	28
Bukidnon	----	----	----	----	----	1	1	12	----	----	14
Cotabato	10	----	----	----	----	2	3	2	----	3	20
Davao	10	2	----	1	----	12	----	2	----	1	28
Lanao	8	----	----	1	----	1	3	1	----	----	14
Sulu	2	----	----	3	----	----	----	----	----	----	5
Zamboanga	69	13	----	17	----	10	9	15	----	11	144
Mountain Province	15	----	----	----	----	3	----	22	----	4	44
Nueva Ecija	11	2	----	2	----	2	----	31	34	----	82
Nueva Vizcaya	5	----	----	----	----	----	----	1	----	----	6
Occidental Negros	82	----	----	----	2	----	----	239	25	37	385
Oriental Negros	13	----	----	----	----	11	----	57	4	----	85
Palawan	61	----	----	53	5	32	----	54	12	1	218
Pampanga	11	9	----	----	----	----	----	3	----	----	23
Pangasinan	50	2	2	10	----	1	----	3	6	----	74
Rizal	29	6	1	6	----	1	----	----	9	1	53
Samar	21	----	----	1	----	2	----	61	----	2	87
Sorsogon	74	6	1	12	1	3	----	89	3	----	189
Surigao	24	3	----	2	4	4	1	35	3	----	76
Tarlac	7	1	----	2	----	1	----	4	4	----	19
Tayabas	93	8	3	30	----	100	----	110	6	8	358
Zambales	39	9	----	3	----	6	----	29	10	----	96
Total	1,152	104	28	200	13	263	21	1,396	156	140	3,473

NOTE.—Ninety-eight licenses are not included in the above figures. These licenses were either canceled or returned.

TABLE NO. 8.—*Statement showing the quantity and value of wood and manufactures of wood exported from the Philippine Islands during the fiscal year 1917 (January 1 to December 31, 1917).*

	Quantity.	Value.
Timber:		
China ..... cubic meters	223	₱8,730
Hongkong ..... do	1,166	72,842
Japan ..... do	26	1,501
Total	1,415	83,073
Lumber:		
United States ..... cubic meters	12,488	483,215
China ..... do	6,453	121,009
Hongkong ..... do	8,310	215,645
Japan ..... do	23	1,995
Australasia ..... do	52	1,646
French East Indies ..... do	3	50
Total	27,329	823,560
Furniture:		
United States		33,441
Hawaii		2,514
Guam		488
Spain		10
China		75
British East Indies		356
Dutch East Indies		311
Hongkong		167
Japan		60
Total		37,422
All other wood:		
United States		84,545
Hawaii		13
Guam		849
Spain		1,000
China		1,044
British East Indies		496
Hongkong		3,919
Japan		708
Australasia		100
Total		92,674
Total		1,036,729

TABLE NO. 9.—*Statement showing the quantity and value of wood and manufactures of wood imported into the Philippine Islands during the fiscal year 1917 (January 1 to December 31, 1917).*

	Quantity.	Value.
Ties for railways:		
United States ..... number..	3,508	₱3,560
Timber:		
United States ..... cubic meters..	1,293	50,140
Germany ..... do.....	1,625	10,640
China ..... do.....	125	612
British East Indies ..... do.....	832	8,157
French East Indies ..... do.....	14	1,266
Australasia ..... do.....	6	335
Total	3,895	71,150
Lumber:		
United States	6,506	183,313
Germany	13	162
Japan	10	1,138
China	91	5,571
British East Indies	171	4,683
French East Indies	7	107
Hongkong	.....	11
Total	6,798	194,985
Furniture:		
United States	.....	47,804
Austria Hungary	.....	24
Germany	.....	1,456
Spain	.....	20
China	.....	11,511
Japan	.....	13,446
British East Indies	.....	310
French East Indies	.....	63
Hongkong	.....	444
France	.....	69
Korea	.....	41
Entered for warehouse	.....	253
Total	.....	75,441
All other:		
United States	.....	537,342
United Kingdom	.....	2,203
France	.....	1,733
Germany	.....	4,475
Italy	.....	1,123
Netherlands	.....	8
Spain	.....	3,226
Switzerland	.....	29
China	.....	95,135
British East Indies	.....	4,471
Dutch East Indies	.....	170
French East Indies	.....	233
Hongkong	.....	330
Japan	.....	109,059
Australasia	.....	9
Entered for warehouse	.....	1,622
Total	.....	761,168
Total	.....	1,102,745

TABLE NO. 10.—*Statement showing the quantity and value of the gums and resins exported from the Philippine Islands during the fiscal year 1917 (January 1 to December 31, 1917).*

	Kilos.	Value.
Copal (almaciga):		
United States	471,284	₱168,970
British East Indies	103,903	12,550
French East Indies	602	100
Japan	16,721	7,150
Australasia	1,050	170
Total	593,560	188,940
Elemi (pili resin):		
United States	78,468	29,392
Japan	380	133
Total	78,848	29,525
Gutta-percha:		
United States	5,653	4,613
British East Indies	8,706	7,027
Total	14,359	11,640
Rubber:		
United States	29,279	80,133
Hongkong	550	64
Total	29,829	80,197
Total	716,596	310,302

TABLE No. 11.—*Statement af appropriations and expenditures Bureau of Forestry (January 1 to December 31, 1917).*

Appropriation:		
Act No. 2672	₱294,340.00	
Emergency board resolution No. 32	5,000.00	
Total		₱299,340.00
Expenditures:		
Salaries and wages	206,813.31	
Furniture and equipment	4,965.26	
Traveling expenses of personnel	36,874.34	
Rentals of buildings and grounds	2,324.44	
Freight, express, and delivery service	1,348.98	
Printing and binding reports, documents, and publications	1,500.00	
Postal, telegraph, and cable service	3,600.00	
Illumination and power service	1,352.24	
Plant and equipment repair service	1,111.64	
Contingent service	1,274.20	
Consumption of supplies and materials	16,298.72	
Total expenditures		277,463.13
Balance		21,876.87
Appropriation for Cebu reforestation (Act No. 2649):		
Balance January 1, 1917		6,576.91
Expenditures:		
Salaries and wages	1,401.06	
Traveling expenses of personnel	406.90	
Freight, express, and delivery service	103.26	
Postal, telegraph, and cable service	22.10	
Consumption of supplies and materials	1,495.43	
Rentals of buildings and grounds	72.50	
Plant and equipment repair service	.60	
Furniture and equipment	160.65	
Total expenditures		3,662.50
Balance		2,914.41
Appropriation for Forest School building (Act No. 2583):		
Balance, January 1, 1917		6,069.65
Expenditures		6,026.97
Balance reverted to Insular Treasury as per journal voucher No. 149618		42.68
Appropriation for Agusan reconnaissance (Act No. 2521):		
Balance, January 1, 1917		284.85
Expenditures		284.85
Statement of Bureau of Forestry appropriations, expenditures, and revenues for fiscal year 1917:		
Appropriations		305,916.91
Revenue		536,328.17
Expenditures		281,125.63
Surplus		255,202.54
Percentage of expenditures to revenue		.53

DIRECTORY OF THE BUREAU OF FORESTRY.

ARTHUR F. FISCHER, *Director.*

DIVISION OF FOREST MANAGEMENT.

Theo. C. Zschokke.....Chief, Forester.
F. L. Pray.....Forester.
Ramon J. Alvarez.....Assistant Forester and Inspector.
Ciriaco Lopez.....Ranger, Revisor of field work.
Luis Agudo.....Junior Stenographer.
E. E. Schneider.....Wood expert.
Luis J. Reyes.....Ranger.
Justo M. Pascual.....Ranger.
Valentin Franco.....Clerk.
Aurelio Maglunog.....Clerk.
Hermogenes Castañeda.....Varnisher.
Mariano Sangalang.....Carpenter.
Juan Abadilla.....Laborer.

LICENSE SECTION.

Eufemio Santillán.....Chief.
Lorenzo Pakingan.....Clerk.
Policarpo Santos.....Clerk.
Florentino Tenorio.....Clerk.

DISTRICT NO. 1.

[Provinces: Cagayan, Isabela, Nueva Vizcaya and Amburayan.]

Forest station at Aparri, Cagayan (district headquarters):
Nazario Peñas.....Head ranger, in charge.
Benigno Alejandro.....Ranger.
Deogracias Guzman.....Ranger.
Benito Agdamag.....Forest guard.
Forest station at Tuguegarao, Cagayan:
Temporarily closed.
Forest station at Ilagan, Isabela:
Cayetano Barros.....Ranger, in charge.
Ventura C. Achanzar.....Forest guard.
Forest station at Echague, Isabela:
Vicente Velasco.....Ranger, in charge.
Eugenio de la Cruz.....Forest guard.

DISTRICT NO. 2.

[Provinces: Ilocos Norte, Ilocos Sur, Amburayan (Mt.), Abra and La Union.]

Forest station at Vigan, Ilocos Sur (district headquarters):
Espiritu Paraiso.....Head ranger, in charge.
Pastor de la Peña.....Ranger.

DISTRICT NO. 3.

[Province: Mountain Province (Benguet, Bontoc, and Lepanto).]

Forest station at Baguio, Benguet (district headquarters):
- Eladio C. Leaño.....Ranger, in charge.
- Gregorio Labitag.....Ranger.
- Sixto Laraya.....Ranger.
- Pedro Gacad.....Forest guard.
- Esperidion Gapuz.....Forest guard.
- Silverio Gapuz.....Forest guard.
- Benito Rillorta.....Forest guard.
- Nicolas Macusi.....Forest guard.

DISTRICT NO. 4.

[Provinces: Pangasinan, Nueva Ecija, Tarlac and Northern Zambales.]

Forest station at Dagupan, Pangasinan (district headquarters):
- Felipe Danao.....Head ranger, in charge.
- Felix Bawan.....Ranger.
- Juliano Daclison.....Ranger.

Forest station at Cuyapo, Nueva Ecija:
- Probo Villanueva.....Ranger, in charge.

Forest station at Cabanatuan, Nueva Ecija:
- Vitaliano Villavicencio.....Ranger, in charge.
- Mauro Baculi.....Ranger.

DISTRIST NO. 5.

[Provinces: Batangas, Laguna and Tayabas.]

Forest station at Los Baños, Laguna (district headquarters):
- Roscoe B. Weaver.....Forester, District Forester.
- Ismael Pascual.....Ranger.
- Fernando L. Amarillas.....Ranger.
- Adriano Santos.....Ranger.
- Crispino Tansioco.....Ranger.
- Eulogio Duldulao.....Ranger.
- Severo Abellera.....Clerk.
- Alipio Larracas.....Forest guard.
- Felix Columbres.....Forest guard.
- Antonio Yafana.....Forest guard.

Forest station at Infanta, Tayabas:
- Catalino Cailipan.....Ranger, in charge.

Forest station at Laguimanoc, Tayabas:
- Alejandro de Mesa.....Ranger, in charge.
- Fortunato Manuel.....Ranger.
- Bernabe Guieb.....Ranger.
- Benito Acedillo.....Forest guard.
- Francisco Vargas.....Forest guard.

Forest Station at Lucban, Tayabas:
- Enrique Resultan.....Ranger, in charge.

Forest station at Calauag, Tayabas:
- Macario A. Mariano.....Ranger, in charge.
- Pedro Afalla.....Ranger, Scaler.
- Atanasio Catambay.....Ranger, Scaler.

DISTRICT NO. 6.

[Provinces: Albay, Ambos Camarines and Sorsogon excluding Masbate.]

Forest station at Naga, Ambos Camarines (district headquarters):
- Porfirio San Buenaventura.....Ranger, in charge.
- Mauro Ablaza.....Ranger.
- Manuel Montalvo.....Ranger.
- Catalino Clemente.....Clerk.

Forest station at Legaspi, Albay:
- Felipe Fajatin.....Ranger, in charge.
- Eugenio Espiritu.....Forest guard.

Forest station at Paracale, Ambos Camarines:
- Fausto Alambra.....Ranger, in charge.
- Tomas Manzano.....Ranger.
- Pedro Magistrado.....Forest guard.

Forest station at Sorsogon, Sorsogon:
- Filemon Kapuno.....Ranger, in charge.
- Alejandro Eguarras.....Forest guard.

DISTRICT NO. 7.

[Provinces: Antique, Capiz, Iloilo, Negros Occidental, and Romblon.]

Forest station at Iloilo, Iloilo (district headquarters):
- Juan Lopez.....Ranger, in charge.
- Mamerto Azurin.....Ranger.
- Leonardo Laguio.....Ranger.
- Vicente Villaflor.....Ranger.
- José Reliz.....Junior stenographer.

Forest station at Cadiz, Negros Occidental:
- Tomas N. Roque.....Ranger, Scaler, in charge.
- Melecio Lopez.....Ranger.
- Pedro Hinolan.....Ranger.
- Nicanor Legaspi.....Ranger, Scaler.
- Teodoro Oliveros.....Forest guard.
- Januario Buensuceso.....Forest guard.
- Hermogenes Doblon.....Forest guard.

Forest station at Fabrica, Negros Occidental:
- Felipe Amos.....Ranger, Scaler.
- Juan Verzosa.....Ranger, Scaler.
- Ruperto Yzarri.....Forest guard.

Forest station at Ilog, Negros Occidental:
- Ramon Larracas.....Ranger, in charge.
- Deogracias Mendoza.....Ranger.
- Inocencio Debuyan.....Forest guard.

Forest station at Calivo, Capiz:
- Isabelo Achacoso.....Ranger, Scaler, in charge.

Forest station at San Carlos, Negros Occidental:
- Jesus O. Duran.....Ranger, in charge.

DISTRICT NO. 8.

[Provinces: Zamboanga, Cotabato, Davao, Sulu, Misamis, Lanao, and Bukidnon.]

Forest station at Zamboanga, Zamboanga (district headquarters):
- James Logan.....Forester, District Forester.
- Charles Kollman.....Field assistant.

Forest station at Zamboanga, Zamboanga (district headquarters)—Cont.
Benito L. Roque.....Ranger.
Leon Belen.....Ranger, Scaler.
Teodoro Tecson.....Ranger, Scaler.
Bernardo Serafica.....Clerk.
Forest station at Cotabato, Cotabato:
Severo Oliveros.....Ranger, Scaler, in charge.
Sixto Babao.....Ranger, Scaler.
Forest station at Davao, Davao:
Simplicio Aguilar.....Head ranger, in charge.
Vicente Ceballos.....Ranger.
Forest station at Isabela, Basilan:
Leon C. Franco.....Ranger, Scaler, in charge.
Teodoro Colcol.....Ranger, Scaler.
Forest station at Kolambugan, Lanao:
Bernardo Tocmo.....Ranger, Scaler, in charge.
Enrique Alviar.....Ranger, Scaler.
Gregorio Miras.....Ranger, Scaler.
Manuel Malana.....Ranger, Scaler.
Forest station at Naga-Naga, Zamboanga:
Santiago Babaran.....Ranger, Scaler, in charge.
Macario Simeon.....Ranger, Scaler.
Nicanor Santos.....Ranger.
Forest station at Port Banga, Zamboanga:
Antonio Somonte.....Ranger, Scaler.
Jose Phasis C.....Ranger, Scaler.

DISTRICT NO. 9.

[Province: Palawan.]

Forest station at Puerto Princesa, Palawan (district headquarters):
Apolinario Suyat.....Ranger, in charge.
Max. E. Fernandez.....Ranger.
Forest station at Coron, Palawan:
Ptolomeo Causing.....Ranger, in charge.

DISTRICT NO. 10.

[Provinces. Leyte, Surigao, Samar and Masbate (Sorsogon).]

Forest station at Tacloban, Leyte (district headquarters):
Felix Franco.....Ranger, in charge.
Carlos Guerrero.....Ranger.
Eusebio Leuterio.....Ranger.
Perfecto Tomeldan.....Ranger.
Inocencio Ramirez.....Ranger.
Alfonso Salazar.....Forest guard.
Forest station at Catbalogan, Samar:
Pedro Lasquety.....Ranger, in charge.
Ramon Acuña.....Ranger.
Forest station at Masbate, Sorsogon:
Numeriano Valencia.....Ranger, in charge.
Forest station at Surigao, Surigao:
Angel Mallonga.....Ranger, Acting, in charge.

DISTRICT NO. 11.

[Provinces: Bataan, Pampanga, Bulacan, and part of Zambales.]

Forest station at Orani, Bataan (district headquarters):
- Agapito L. Cenabre.....Ranger, in charge.
- Julio Baldemor.....Ranger.
- Braulio Cristobal.....Ranger.
- Hilario Borromeo.....Forest guard.

Forest station at Limay, Bataan:
- Donato P. Miranda.....Ranger, Scaler, in charge.
- Lorenzo de Guzman.....Ranger, Scaler.
- Valentin Sajor.....Ranger, Scaler.

Forest station at Moron, Bataan:
- Pablo Tuñgol.....Ranger, in charge.
- Teodoro Mgalindan.....Forest guad.

Forest station at Norzagaray, Bulacan:
- Pedro Gañgan.....Ranger, in charge.
- Exequiel Angeles.....Forest guard.

DISTRICT NO. 12.

[Province: Mindoro.]

Forest station at Calapan, Mindoro (district headquarters):
- Cecilio Maneja.....Ranger, in charge.
- Cornelio Nable José.....Head ranger.
- Emeterio Edmilao.....Ranger.
- Antonio Martinez.....Ranger.

Forest station at San José, Mindoro:
- José Medina.....Ranger, in charge.

DISTRICT NO. 13.

[Provinces: Cavite and Rizal.]

Forest station at Manila (district headquarters):
- Domingo L. Diaz.....Head ranger, in charge.
- Clemente Mariano.....Head ranger.

DISTRICT NO. 14.

[Provinces: Cebu, Bohol, Negros Oriental, and Agusan.]

Forest station at Cebu, Cebu (district headquarters):
- José B. Hirro.....Ranger, in charge.
- Vicente Defensor.....Ranger.
- Antonio Rodrigues.....Forest guard.

Forest station at Dumaguete, Negros Oriental:
- José Lazaro.....Ranger, in charge temporarily.
- Cruz V. Muñasque.....Ranger.

Forest station Talisay, Cebu (reforestation project):
- Placido Dacanay.....Ranger, in charge.
- Francisco L. Rola.....Ranger.

Forest station at Butuan, Agusan:
- Aquilino Contreras.....Ranger, in charge.

DIVISION OF FOREST LANDS AND MAPS.

Rafael Medina.....Chief.
Vicente Malana.....Clerk.

LANDS SECTION.

Doroteo Soriano	Ranger, in charge.
Andres Bernardo	Head ranger.
Luis Serrano	Ranger.
Edilberto Madrid	Ranger.
Vicente Castillo	Ranger.
Felipe Valderrama	Ranger.
Severo Ponce	Ranger.
Fausto Turla	Clerk.
Pedro Gorospe	Clerk.
Pedro Agbayani	Clerk.

MAPPING AND DRAFTING SECTION.

Cornelio Samaniego	In charge.
Cayetano Crisostomo	Draftsman.
Gregorio Vicencio	Draftsman.
Hermogenes Reyes	Draftsman.
Meliton Alaoria	Draftsman.
Eliseo Romualdo	Draftsman.

DIVISION OF INVESTIGATION (LOS BAÑOS).

Dr. Fred. W. Foxworthy	Chief.
James R. Gillis	Instructor in Forestry.
Mauricio J. Oteyza	Forester, (temporarily assigned to Baguio).
Maximo Oro	Ranger.
José F. Nano	Ranger.
Carlos Sulit	Ranger.
Calixto Mabesa	Ranger.
Nemesio Catalan	Ranger.
Pastor Martelino	Ranger.
Placido Dacanay	Ranger, (special assignment to District 14).
Francisco L. Rola	Ranger, (special assignment to District 14).
Segundo Peñaflor	Nurseryman.
Florentino Canicosa	Forest guard.
Nicolas Angeles	Forest guard.
Fernando Aquino	Forest guard.
Domingo Ilag	Forest guard.
Rufino Manzano	Forest guard.
Severo Parado	Forest guard.
Pedro Ortega	Forest guard.
Vicente Supleo	Junior stenographer.
Jovite Unite	Junior stenographer.

DIVISION OF SAWMILLS AND UTILIZATION.*

William Crosby	Chief, Forester.
M. W. Rice	Lumber inspector.
Florencio Tamesis	Assistant forester.

ADMINISTRATIVE DIVISION.

Cirilo Asperilla	Chief Clerk (Acting).
Vicente C. Ramos	Stenographer and disbursing officer.
Pedro Asuncion	Junior stenographer.
Jose Alegre	Clerk.
Pelagia Fernandez	Telephone operator.
Valentin Cordero	Messenger.

* All scalers under Division of Forest Management also under this division.

RECORD SECTION.

Isidoro Sebastian ..... Chief.
Juan Ipac ..... Clerk.
Aquilino C. Bartolome ..... Messenger.
Mauro Linchanco ..... Messenger.

ACCOUNTING SECTION.

Eugenio Tadle ..... Chief.
Simeon Mangaliman ..... Clerk.
Angel del Rosario ..... Clerk.
Sulpicio Olimpo ..... Clerk.
Primitivo Bello ..... Clerk.

PROPERTY SECTION.

Simplicio Beltran ..... Chief.
Ramon Jingco ..... Clerk.
Venancio Babida ..... Clerk.
Severino Esguerra ..... Watchman.
Epitacio Oblepias ..... Watchman.
Crisanto Navarro ..... Laborer.
Bartolome Estacio ..... Janitor.
Feliciano Guiling ..... Janitor.
Mariano Aldama ..... Chauffeur.

○

ERRATA

Page 5, line 26, should read "forest officers" instead of "foresters".

Under line 2, of License Statistics "1918" should read "1917".

On page 13, line 14, "licensed" should read "license".

Page 35, line 8, under "Utilization," "everage" should read "average".

Page 56, in second line from bottom, "16.2 square kilometers" should read "162 square kilometers". Likewise, on page 57, line 1, "25.2 square kilometers" should read "252 square kilometers" and in line 3, "4.2 square kilometers" should read "42 square kilometers".

The first two words of line 4, page 59, should read "Bureau's charge" instead of "Bureaus charged".

Table 1, of the Appendix is changed as per inserted sheet.

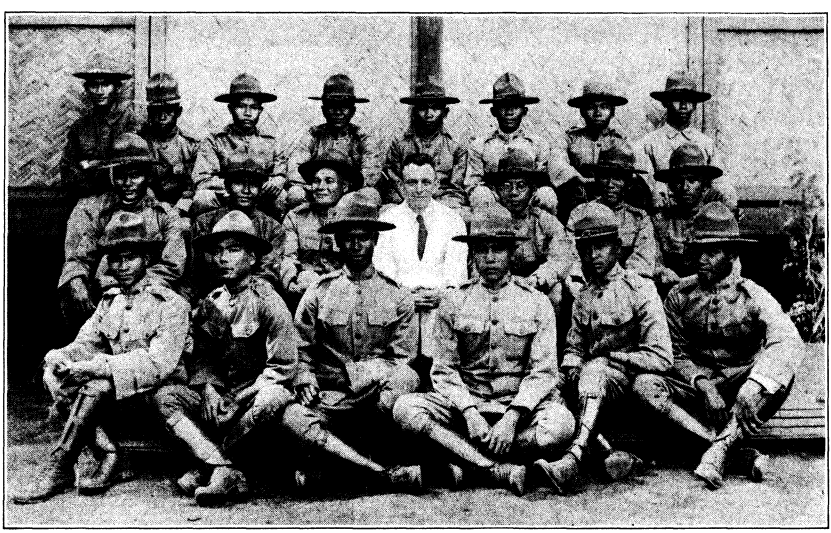
Page 71, column "1906, Homesteads, Total" should read "334" instead of "344".

Table 8, page 82, third sum from bottom of Value column should read "30,346" instead of "62,501".

Table 9, page 83, fourth line from the bottom ₱650,691.66 should read ₱650,691.62 and second line from bottom should read therefore ₱316,437.74.



Division of Investigation and Forest School, Los Baños, Laguna.



Forest School Graduates in the Philippine Guard. The man to the right of the Director received his training in the United States.

PLATE I.

Philippine Islands Bureau of Forestry

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1918

ARTHUR F. FISCHER
Director of Forestry

MANILA
BUREAU OF PRINTING
1919

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY.

MANILA, *March 3, 1919.*

SIR: I have the honor to submit herewith the Annual Report of the Bureau of Forestry for the fiscal year 1918, covering the period from January 1 to December 31, 1918.

WAR ACTIVITIES.

Very close coöperation was maintained by the Bureau of Forestry with the army officials of the Department of the Philippines in supplying information as to products for war work. Administration of all military reservations, in so far as forest activity was concerned, was placed in the hands of the Bureau of Forestry and information was given as to the stands and availability of woods for various purposes for the Army. The same coöperation was maintained with the Navy in respect to naval reservations. During the past year the Bureau of Forestry instituted an organization to supply the Navy with rattan for war work and helped the Department in its reconnaissance of naval reservations containing timbers to determine sources of future supply of woods and other products. Information was supplied to the various naval authorities at Hongkong, the British army authorities in India, and the French naval authorities in Saigon. Help was given lumbermen furnishing supplies for war work. The various offices of the Philippine Department, U. S. Army, were able to use the personnel of the Bureau, as well as past information along various lines. Help was also accorded the Council of National Defense. All this coöperation and help would have been impossible had it not been for the work done in past years.

In June, one assistant forester, one forest supervisor, seventeen rangers and two students from the Forest School entered the officers' training camp of the Philippine Guard preparatory to federalization. It is gratifying to note that out of the 21 foresters entering the Philippine Guard, twenty of whom were Forest School graduates, only one resigned and the rest were all proficient enough to obtain commissions. The assistant forester received his training in the United States. The withdrawal of this number, although small, made great inroads on the technically trained

personnel of the Bureau of Forestry, necessitating a complete shift in personnel. Many projects had to be partially abandoned, and some new ones could not be inaugurated. Practically 80 per cent of the technical personnel of the Bureau of Forestry signified their intention of entering the war if possible, through the Philippine Guard, but the Government only allowed the release of the number stated above. The wood expert, on account of his knowledge of European languages, has been detailed since August 1 to work afternoons in the chief mail-censor's office for the duration of the war.

During the year, Red Cross subscriptions within the Bureau amounted to ₱688.50. Through the courtesy of the Governor-General, the Director was given permission to solicit subscriptions amongst the lumbermen and Bureau personnel for the Forestry Regiment Fund and the total collection amounting to ₱1,706.50 was forwarded to Washington. The results of the various Liberty Loan drives during the past year have been particularly gratifying to the undersigned, because of the large number of subscriptions by Filipino employees.

LEGISLATION.

During the past year no new bills were introduced by the Legislature directly or indirectly touching upon forestry matters.

The bill to which attention was called in last year's annual report, containing provisions for the protection of fruit trees found in the forest, has again been introduced.

The Bureau of Forestry proposed quite a few changes in the wording of the sections of Chapter 47, known as the Forest Law, of Act 2711 (the Administrative Code) under which the Bureau of Forestry operates. These changes are very necessary to remove ambiguities and to make clear certain phrases in the present sections of the forest law.

Suggested changes were sent to the Bureau of Internal Revenue to be submitted by them for the sections of the Bureau of Internal Revenue Law having to do with forest products.

Suggested bills were submitted for a special reforestation act, as well as for reconnaissance, and attention was called to the lack of adequate administration of fisheries and game. Under the Administrative Code, the Bureau of Forestry is empowered to grant fish-pond permits, but no adequate means is available for the administration of general fisheries or for enforcing the present game laws of the Islands. The Bureau of Forestry has found it very difficult, during the past year, to apprehend people setting fire to kogon areas. As these fires are generally set by hunters, if the administration of the game laws were

turned over to the Bureau of Forestry, the number of fires would be greatly decreased, and game would be afforded better protection in the Philippines.

PERSONNEL.

The question of personnel has become increasingly important in the Bureau. The appropriation for salaries in this Bureau has not been sufficient to even pay the men, especially the field personnel, the salaries which prevail in other bureaus of the Government, for work requiring an equal degree of technical knowledge and experience. A comparison of the salaries paid with what the men could receive in private enterprise, coupled with the increased cost of living, has made it most difficult to hold the personnel. As the average ranger's expense for board and room throughout the Islands amounts approximately to ₱25 or ₱30 a month, and his salary to ₱75, it can be seen that not much money is left for clothing and other necessities. Probably no other Government employees are subject to such physical and mental discomforts in carrying on their work. As most of it is conducted in the more isolated and forested regions of the Philippines, generally distant from habitations and from centers of civilization, they have to forego many of the advantages accruing to other Government employees. Transportation in many parts of the Philippine Islands is exceedingly difficult. In the past year rangers who were ordered to make inspections were forced to take small bancas for long trips and have been blown way out of their course into the open sea, experiencing dangers which would have deterred other men from similar modes of travel in the future.

The cost of supplying themselves with clothing, especially footwear, during their arduous field trips in the tropical forest usually amounts to twice and sometimes as high as four times the cost to other Government employees. In many instances no trails whatever are available. Travel through the jungle is not pleasant and practically all of it is on foot. A pair of good shoes for field work generally lasts about one month and many rangers have worn out, on occasions, as many as three pairs of shoes per month. As a result, with the present high prices of footwear, the rangers have been using alpargatas, which last a very short time and do not afford sufficient protection for the feet. Sickness has been prevalent among the field force, and in many instances rangers have been taken sick among the hill tribes where no medical attention was available. After field trips fully 70 per cent of the men took sick leave because of fevers and other ailments. These facts must be recognized, and

it is obvious that the Government should take cognizance of them and place the Bureau of Forestry personnel at least on an equal plane with other bureaus in regard to salaries of men of equal technical training.

During the past year rangers and clerical personnel have constantly requested transfers or presented their resignations, which were generally refused, because of lack of men to carry on the administrative and other work of this Bureau. Requests have come from foreign governments for trained rangers as well as clerks of this Bureau at much higher salaries than they receive here, and this has tended to create a restive condition, as few resignations were allowed, although the undersigned personally does not feel that he should be the means of holding the men down to positions where the financial reward is not sufficient to provide an adequate living. It has only been through a highly developed *esprit de corps* that this Bureau has been able to hold the majority of its men; but with the constant pressure necessary under present conditions, with an inadequate personnel, offering no inducements other than hard work, as compared with what other bureaus can offer in the way of promotion and much more congenial work, the undersigned feels that the Government should take a timely interest in keeping up a technical organization such as this Bureau has. Rangers who were trained in lumber grading and scaling were particularly in demand by the lumber companies, not only in the Philippines, but in the Federated Malay States as well. One ranger whose resignation was not accepted, simply quit the service, forfeiting his accrued leave, as he was offered a salary and opportunities which under the circumstances he felt could not be refused.

The following changes in personnel have occurred during the past year. Two of the rangers who were instructors in the Forest School resigned, one to enter West Point and the other to take up advanced work in the College of Agriculture. The latter is now receiving as much money as student assistant at the College of Agriculture as he had been getting in this Bureau. One ranger died, two were dismissed for the good of the service, and three resigned. Of these one took up the study of law, another went into the timber business, and the third was put in charge of the Negrito Settlements in Zambales. Two others were dismissed for abandoning their work without giving sufficient notice to this Bureau to enable it to send men to take their places. One American field assistant was dismissed for disloyalty and one American forester went on leave and resigned.

The following appointments were made during the year: Mr.

A. D. E. Elmer, botanist, was appointed an instructor in the Forest School and Mr. Antonio Racelis, who had been formerly a ranger in the Bureau of Forestry and had taken advanced work in Forestry in the United States, was appointed assistant forester. Eighteen graduates from the Forest School also received appointments as rangers. In addition to these, three of the most capable rangers were promoted to be forest supervisors. Their duties are to confer with the local forest officers, assist and advise them concerning their work and to carry on such special work as may be assigned by the Manila Office.

Practically all the technical men who might have been induced to come to the Philippines, have been engaged in war work in the United States and for this reason, it was not possible to secure the necessary men to establish the advanced courses at the Forest School.

The permanent force on January 1, 1918, consisted of 1 director, 7 foresters, 1 dendrologist, 1 lumber inspector, 1 wood expert, 3 assistant foresters, 3 forest supervisors, 120 rangers, 8 draftsmen, 41 clerks, and 2 messengers, besides the following employed on a temporary status: 1 nurseryman, 11 laborers, 1 carpenter, 1 varnisher, 48 guards, 2 watchmen, 2 janitors, 1 chauffeur, 1 launch engineer, 1 launch patron, 1 launch sailor, and 1 telephone operator, making a total of 259 employees.

ORGANIZATION.

The reorganization described in the previous annual report has proven very satisfactory and has not been altered. The distribution and location of the clerical sections in the Manila Office were rearranged this past year, however, in order to promote greater efficiency and give more office space. These sections are now more accessible to the general public and still remain under the supervision of the various section chiefs.

EFFICIENCY.

The regular field work has been performed as in the past, but the plan of establishing a corps of rangers to carry on special investigation work had to be suspended owing to the lack of personnel. With the return of the men now with the Philippine Guard, it is planned to again organize this corps, with better prospects of success. Unless this is done, owing to the rapidly increasing work from year to year and the greater detail necessary, it will be impossible to carry on successfully even the regular field work.

Transfers of rangers, disciplinary measures, and recommendations for promotion were acted upon by a personnel committee, composed of the chiefs of divisions and the inspectors in the Manila Office.

FOREST AND SPECIAL INDUSTRIES.

As a whole, the forest-products industries have enjoyed greater prosperity than ever before in the history of the Islands, and despite the enormous prices, the demand far exceeded the supply. It is only fair to state, however, that while the profits of lumber and forest-product dealers in general were large, they were by no means as great as prices would seem to indicate. The reason for this apparent anomaly is the excessive freight charges collected. For a considerable period of the year, it was customary for ship owners to charge ₱46.22 a cubic meter, or else take one-half the selling price of timber shipped from Southern Palawan to Manila. Freight rates on rattan and firewood, the two other principal forest products, were in proportion.

DIVISION OF FOREST MANAGEMENT.

The division of forest management is charged with the use and protection of the public forests of the Philippines. The work consists of issuing licenses for forest products, inspecting the work of licenses, and supervising the work of all field men. Towards the end of the year, instructions were issued by the Secretary of Agriculture and Natural Resources that all licenses of any description were to be issued only from the Manila Office. As each officer in charge of a district had previously been authorized to issue minor-product licenses and timber licenses which did not exceed a stipulated amount of timber, this immediately threw an enormous amount of additional routine work on the Manila section of this division. As a result, it has not been possible for the chief to devote the desirable and necessary time to the special features of his work. The new forest regulations have proven satisfactory and have given an impetus toward the better utilization of the forest, more particularly to those susceptible of being managed in accordance with a definite plan.

The former haphazard method of cutting firewood in mangrove swamps has resulted in the complete destruction of Bakauan, Tangal, and other desirable trees in most of the swamps accessible to exploitation, their places being taken by Api-api and other species which are inferior as fuel. By leasing the swamps under long term licenses or permits, the operators have been given some inducement to cut trees conservatively and to replant vacant areas. As might have been expected, the mangrove

swamps which had suffered the most from exploitation, were the first to be put under control. Most of these licensees expect to construct fishponds and will cut firewood merely as a side issue.

A Teak reservation was also established in Jolo by proclamation of the Governor General, dated October 31, 1918. The area included in this reservation contains the largest known stand of Teak in the Philippine Islands.

FOREST DISTRICTS.

District No. 13 was amalgamated with District No. 11 and District No. 14 renumbered 13, in order to keep the numbers consecutive. The headquarters of District No. 11 was transferred to Manila, as it was found that many licensees came to Manila to transact their business and furthermore, this change made it possible to do without the ranger who had entered the Philippine Guard training camp.

The western coast of Leyte being in frequent communication with Cebu, was transferred to District No. 13 (formerly No. 14) as it was found easier for the forest officer at Cebu, who is the officer in charge of District No. 13, to visit this region than for the ranger located in Tacloban.

INSPECTION.

The undersigned visited Districts 3, 5, 6, 7, 8, 10, 12, and 13, and Districts 3, 5, 7 and 11 were also inspected by men from the Manila Office. During the coming year an effort will be made to inspect every district headquarters at least once and as many of the forest stations as the other work of the undersigned and the division chiefs will permit. A much better idea of the efficiency of the rangers and the needs of their stations is obtained through a close personal inspection, than is possible by correspondence; and, furthermore, the rangers, knowing that they and their stations are to be inspected, show greater energy and thoroughness in their field work than if no inspections are made.

SUPERVISION.

Three forest supervisors and one acting forest supervisor were appointed in June, 1918. One of the supervisors entered the Philippine Guard in July, however, and did not assume the duties of his new position. Owing to the entrance of many experienced rangers into the Philippine Guard, supervisors were forced to help in the ordinary routine work of their districts and, for this reason, the inspection of rangers' stations and the

checking of their reports has been very incomplete and unsatisfactory.

Arrangements are now being made for the resumption of this work and upon the return from the Guard of these men and the appointment of three additional supervisors, provision for which has been made in the appropriation for 1919, it is hoped to bring this work up to the standard of efficiency originally planned.

LICENSE STATISTICS.

During the year 1918, ordinary timber licenses increased 608 in number over those issued in 1918, there being a total of 2,514 in force. This does not include those which were returned or cancelled. There was also an increase of 62 in the number of gratuitous licenses issued, the total being 1,845. The most noteworthy feature of the increased number of ordinary timber licenses, as indicating the increased volume of business, is the fact that it was almost entirely confined to licenses issued for large amounts of timber. The number of licenses for 100 cubic meters and less than 1,000 cubic meters increased 471 in number, while those for 1,000 cubic meters and over increased 117 in number, exactly double the number issued the previous year.

For minor forest products, a total of 4,519 licenses were issued, an increase of 1,046 over the previous year. As was to be expected, the greater part of this increase was divided between rattan and firewood, these being the two most important minor products. Tables showing in detail the licenses issued during the year will be found in the appendix.

All ordinary forest product licenses issued during 1918, were dated to expire December 31, 1919.

OFFENSES OF LICENSEES.

With the new regulations of the Bureau of Internal Revenue together with those of the Bureau of Forestry, it is easier to punish licensees who attempt to defraud the Government. In the past, it was comparatively a simple thing for a licensee to persuade a municipal treasurer that the tree names which he furnished were the local names for fourth-group timber. The treasurer, being often from a different region or speaking a different language, was unable to detect the fraud and assumed that the licensee was honest in his classification.

During the past year, the Bureau of Forestry has been receiving copies of all invoices and is enabled to determine whether or not the classification is correct. It has been found that many

licensees are merely using local names which would reduce the timber from a higher to a lower group. A circular was prepared two years ago giving synonyms of tree names. This is now being revised and will be issued in the near future. Reference to this circular by licensees and municipal officials will reduce the erroneous classification of timber, and will prevent misunderstanding between the licensees and the Internal Revenue agents as well as between licensees and timber buyers.

In connection with the examination of invoices, one or two rangers stationed in Manila have been detailed to coöperate with the Bureau of Internal Revenue in checking timber shipments arriving in Manila.

During the past year, an owner of timber illegally cut on a licensed area disposed of the timber after it had been embargoed by an Internal Revenue officer. He was prosecuted and convicted, receiving a severe sentence. This is the first case of its kind recorded in the files of this Bureau. Licensees who persistently violate the Internal Revenue or Bureau of Forestry regulations forfeit their licenses.

OFFENSES OF NONLICENSEES.

There has been a marked decrease during the past year in the number of complaints received of illegal cutting by nonlicensees. This is attributed to the increased efficiency of the patrol work and inspection of barrios by the forest guards.

FUTURE SPECIAL WORK.

The chief work planned for 1919 will be the putting of the tidal swamps under systematic management as rapidly as they can be surveyed and questions of conflicting ownership settled. The establishment of forest and agricultural zones will be taken up as rapidly as there is personnel available for this work.

CAIÑGINS.

The number of illegal caiñgins reported during 1918 was 776, an increase of 111 over those reported in 1917. This increase is located in the Provinces of Negros Occidental, Samar, Albay and Ambos Camarines. In the case of the first-named province, it was probably due partly to the misunderstood propaganda of municipal officials to plant increased food crops and partly to land hunger, the excessive cost of rice and corn undoubtedly having a stimulating effect. In the case of the last three provinces, while government propaganda was undoubtedly responsi-

ble for a part of the increase, the principal factor was the abnormal prices paid for abaka, which is the chief industry of these provinces. As abaka requires a considerable amount of shade, by clearing the underbrush and girdling a few of the largest trees, a virgin forest can be prepared for abaka planting with a minimum expenditure of time and labor.

With the exception of these four provinces, the reports from the rest of the Islands are very favorable, showing that the propaganda which the forest officers have been carrying on against this evil has begun to show beneficial results.

Caiñgins reported during the fiscal year 1918 (January 1 to December 31, 1918).

Province.	Reported by—		Total.	Action of courts—		Total.
	Forest officer.	Municipal president.		Convicted.	Acquitted.	
Abra						
Albay	83		83			
Ambos Camarines	76		76	9	8	17
Antique	13		13			
Bataan	5		5			
Batangas						
Batanes						
Bohol				2		2
Bulacan	23		23			
Cagayan	9		9			
Capiz	4		4	2	2	4
Cavite						
Cebu	49		49	8		8
Ilocos Norte						
Ilocos Sur	3	12	15			
Iloilo	4		4			
Isabela						
Laguna	1		1			
La Union						
Leyte	9		9	7	2	9
Mindoro	42		42			
Misamis	6		6			
Department of Mindanao and Sulu:						
Agusan						
Bukidnon	1		1		1	1
Cotabato						
Davao						
Lanao						
Sulu						
Zamboanga	17		17	8		8
Mountain Province						
Nueva Ecija	3		3			
Nueva Vizcaya						
Occidental Negros	125		125	12	1	13
Oriental Negros						
Palawan	63		63	4		4
Pampanga	18		18			
Pangasinan	9	18	27	14	5	19
Rizal	4		4	1		1
Romblon						
Samar	92		92	6	2	8
Sorsogon	19		19	15		15
Surigao	11		11	6		6
Tarlac						
Tayabas	53		53	24	1	25
Zambales	4		4			
Total	746	30	776	118	22	140

NOTE.—It is most probable that several of the reported cases have already been acted upon, tho this Office has not yet been informed of the fact.

FOREST DISTRICT REPORTS.

The reports from the district officers are generally hopeful in tone and every one seems to be optimistic for the future. Trancazo (grippe), the high cost of living, and high freight rates seem to be common throughout the Philippines.

District No. 1.—Several licensees have tried shipping timber to Manila on schooners and have been very successful. There is considerable risk attached to these shipments, however, because of storms which are very prevalent north of Aparri.

A large lumber company in Manila has purchased a small mill in Cagayan, in order to secure for itself a constant supply of Narra and other woods.

The officer in charge planned to reduce the amount of work incidental to homestead inspection by establishing forest zones, within which no homesteads would be permitted. As he was unable to get the rangers necessary for this work, he was forced to postpone it.

District No. 2.—The rangers in this district coöperated with a representative of the Division of Investigation in establishing forest nurseries.

District No. 3.—A new forest station was established in December at Cervantes for the mutual benefit of the public and this Bureau. A working plan was prepared by Forester Oteyza, aided by 2 rangers, for the Baguio Block and the vicinity of the mines. This plan is intended to insure a continuous supply of timber and firewood for the present and future needs of Baguio City and the mines. The work of fire-protection was continued and the system of patrols has inproved with time and experience. A change was made, however, in the method of patrolling, greater attention being given to cut-over areas, which experience has shown to be most subject to fires and where they do the greatest damage to reproduction. The selection of trees for cutting received greater care than ever before, a total of 8,095 being marked for cutting during the year. An innovation was made in this work by permitting certain of the older and more experienced guards to mark trees, their work being checked, especially in the residential district of Baguio town site, by the forester.

District No. 4.—Apparently the operations of the shipyards at Balangan, Bolinao, were so successful as to encourage the construction of others. There is now a new shipyard at Barrio Lasip, Bolinao, and some talk of establishing another near Agno. The Forest Station at Masinloc was reopened. This was very essential as the region is difficult to reach from other parts of

the district; and, furthermore, the sawmill at that place has been relocated by its new owners and is cutting to its full capacity. Owing to the illness of the officer in charge of the district, it was impossible to locate the boundaries of the proposed forest zones in which it will not be desirable to admit settlers. The establishment of a forest zone in eastern and western Pangasinan is very necessary.

District No. 5.—The district forester was transferred in April to the Manila Office and, therefore, the acting chief of the Division of Investigation was appointed to his place. In addition to the work of inspection undertaken during the year, a reconnaissance by students of the Forest School was made in Southern Tayabas. The local ranger force coöperated. A new station was established at Baler to enable a ranger to make inspection trips through the adjacent territory more frequently than has been the case with the nearest forest station at Infanta.

During November and December the boundaries of the proposed Mount Banahao forest zone were reëstablished and patrol trails around Mounts Makiling and Malaraya were repaired.

A new trail from Barrio San Pedro, Calauag, to Guinayangan was also partially completed. Ten kilometers of the trail have been cleared to a width of three meters and it is now ready for leveling and grading where needed. A few big, fallen trees lying across the trail will have to be removed.

The Apad-Kabibihan trail to connect with the above trail, has been almost finished. The trail is already cleared and foot bridges have been constructed across the few streams encountered. There are, however, a few big, fallen trees yet to be removed.

Another proposed trail to be constructed this year is from Barrio Apad to Barrio Capaluan.

These trails will not only facilitate the work of the rangers on their inspection trips, but will also greatly benefit the people living adjacent to them. In fact, the people are already using these trails, even though incomplete.

District No. 6.—The two sawmills in Ragay municipality showed greatly increased activity, due to the high prices which ruled during the year. Practically their entire output was disposed of in Manila. Operations on Derham Brothers' concession on the eastern coast of Ragay Gulf were almost at a standstill. Despite the fact that they had a very large number of logs cut in different parts of their area, they were unable to ship them. Throughout the southern and eastern parts of Camarines and in Albay, the high prices paid for hemp drew laborers to the hemp plantations, leaving the timber licensees with insufficient

men to carry on their operations. In Sorsogon, the licensees were able to supply the local demand, but there was little or no timber exported.

The demand for firewood and rattan in this district was unprecedented, as also were the prices paid. Because of the latter, a big output of these products was attained, practically all of it being used locally, however. The caingin question was the most serious problem the personnel had to contend with and despite the increasingly effective patrol, there were 210 caingins detected during the year. The three principal reasons for this state of affairs were the misinterpretation of Executive Order No. 59, dated July 18, 1917, which led the people to believe that they were lawfully permitted to make caingins, and the agitation and support given the caingin makers by some local politicians, who encouraged them to declare as private property the virgin forests adjoining their farms. As soon as this land was assessed, the treasurers collected taxes on it. The claimants then submitted their tax receipts as proof of title, when the forest officers attempted to inspect the newly-made caingins. The third reason was the enormous prices paid for abaka, which made all land suitable for cultivation of that plant very valuable.

Twelve communal forests were surveyed during the year.

The forest supervisor in charge made a hasty survey of the forests on the west coast of San Miguel Bay for the purpose of determining the suitability of the tract for commercial exploitation on a large scale. Owing to the lack of personnel, it was not possible to carry out a detailed reconnaissance. He recommended that this be done during 1919.

The establishment of two new forest stations is recommended, one at San José, Ambos Camarines, to facilitate the administrative work in the northwestern and western parts of that province and one on Catanduanes.

District No. 7.—The officer in charge of District No. 7 reports that the sawmills in the southern part of the Philippines have established numerous timber yards throughout his district, but that the firewood situation is now more acute than ever before. A thousand rajas (split firewood) sells at ₱36 per thousand, while rajitas (wood but little larger than kindling) retail at 1 centavo a stick. Naturally the swamps are being combed for firewood and anything that will burn is cut. For various reasons there has been a marked increased in the number of caingins made. Part of this increase may be attributed to detection because of more efficient inspection and part to the excessive prices now being charged for rice and corn.

District No. 8.—The forester of this district is not so optimistic regarding the caiñgin situation as others have been before him. He finds that it is very difficult to control the non-Christian tribes, as the forest guards fear to incur the enmity of these people. Caiñgin making seems to be on the wane among the settlers along the coast, however, particularly as such caiñgins are usually made by Christians and can be easily discovered from the sea. The provincial government of Sulu has placed the large Teak plantation in Jolo under management, but at present operations are limited only to the prevention of fires and the utilization of defective and matured trees. Work on the establishment of a Teak nursery and plantation on the Pasonanca watershed began on November 1, 1918. This project covers an area of approximately 2 hectares.

There has been an increase in the equipment of several of the sawmills around Mindanao. As a result, it has been difficult for many of them to get sufficient logs, so that one mill was forced to shut down.

The reconnaissance project was completed in connection with the exploration work of the National Coal Company tract on the Sibuguey peninsula.

Communal forests in Mindanao will continue to be unpopular as long as public forests are so abundant, and the towns so far apart.

District No. 9.—The timber shipped during the past year amounted to about 9,500,000 board feet as compared with 8,000,000 board feet in 1917. The increase was entirely due to the larger number of motor schooners which engaged in the hauling of timber; during both 1917 and 1918, many of the licensees could have doubled the amount of timber shipped, had they been able to secure sufficient bottoms. Ipil and Kalantas are the principal species being cut. Marang-go, Akle, Molave, and Narra are also cut, but in very inconsiderable quantities. All the other species are cut only for local consumption, as the high freight charges will not permit of their being exported, except at a loss. There were 353 kilometers of trail notes taken during the year. These notes were taken on trips in connection with the inspection of cutting areas, homesteads and caiñgins. Only 15 caiñgin cases were reported during the year, as against 61 the year before. This decrease is undoubtedly due to the propaganda against caiñgins carried on during the previous year, and the increased patrol and inspection trips.

District No. 10.—As already explained, the western coast of Leyte was transferred to District No. 13.

Lumbering operations throughout the district have been much more active owing to the increased demand and higher prices. Lumber in Tacloban is now selling at ₱120 per thousand instead of ₱75, which was the price a year ago. The officer in charge reports that there has been a large increase in the number of homesteaders settling in Masbate and recommends establishing a forest zone there at an early date. A small, 25 horse-power mill has been established at Dagami, Leyte, and another at Dinagat, Surigao. Caingins in the district increased from 111 to 224.

District No. 11.—The ranger at Limay reports that the Cadwallader-Gibson mill is now equipped with 2 large veneer machines. This company is also installing another sawmill on the northwestern side of their concession.

The agricultural portion of Lamao reservation was eliminated from the forest reservation and was immediately applied for under lease. There has been constant trouble from banca makers operating in the interior part of Bataan. It is recommended that the Trade School design a sea-worthy boat such as the Cape Cod dory, which is simple to construct, is easily managed by 1 or 2 men, and is exceedingly stable in rough sea. The manufacture of boats of this character would reduce the present waste caused by the hewing of boats out of the log. The establishment of a Forest Station at Mount Arayat is proposed, not only for the better control of the forest, but also to enable forest officers to supervise the buri swamps to the north of Mount Arayat. The district force has been reduced by enlistment in the Philippine Guard to five rangers and four forest guards. Additional personnel is essential for the proper performance of the field work.

A forest station was constructed at Limay and now serves both as an office and residence for the personnel stationed there.

District No. 12.—A great deal of time has been devoted to the examination of forest lands claimed by individuals who are taking advantage of the opportunity offered by the cadastral survey to include whatever parcels of land pleased them. It is, therefore, necessary for a forest officer to accompany surveyors and take notes of all claims to public forest. There was improvement in transportation facilities in Mindoro during the past year. Unfortunately the Christmas typhoon wrecked one of the boats. Having become accustomed to the improved transportation facilities, the people will look forward to a new launch service. Of course, there is the usual activity among the firewood licensees. As for rattan and other products of the mountain forests, the system of trading posts established by the provincial

government has materially aided in their extraction and exploitation. The mountaineers are encouraged to bring wax, rattan, gogo, and diliman to these stores, where they can trade them for supplies at a reasonable price. Licensees are at liberty to compete and are able to do so, by offering better prices than are paid by the provincial stores.

District No. 13.—This district from the very beginning has been handicapped by a lack of personnel. The forest station at Dumaguete has not been opened during the year and the establishment of a new station at Bohol has been indefinitely postponed. There is a considerable number of licensees in the district who are cutting lumber for their personal use only. Sawmills located in the neighboring provinces furnished most of the lumber found in the market.

Ipil-ipil firewood is bringing nearly the same price as Bakauan.

The hard times due to the high price of food has forced people at Cebu to make more caingins than usual.

During November and December, the sum of ₱2,000 was made available for the construction of a horse trail between the towns of Tanjay on the east coast of Negros Oriental and Tolong on the west coast. The officer in charge of the district with one ranger and one forest guard made a rapid survey of the ground and then ran a survey locating the proposed route. Owing to the lack of laborers due to the trancazo epidemic and the short time available, he was unable to do any construction work. If money is available, it is proposed to open this trail some time during this year, with the hope that the province will then appropriate money to build a first-class road. This route would reduce the distance between the eastern and western coasts by one-half, make a large stand of timber available, and open up a rich agricultural district for settlement by the inhabitants of Cebu.

THE OFFICE OF THE WOOD EXPERT.

In various lines there has been considerable increase in volume of work in this office. The only radically new work taken up was the coöperation with the Bureau of Internal Revenue in assisting Manila agents to identify timber, firewood and minor products shipped here from provincial points.

BOTANICAL AND WOOD COLLECTIONS.

As no considerable reconnaissance projects were carried out during the year, the number of botanical collections was small, only 377 specimens being received. Of these, however, an unusually large proportion were accompanied by wood specimens, numbering 132 and including numerous species not previously

represented in the collections. Also, there was received a lot of nearly 500 wood specimens authenticated by botanical collections of Mr. A. D. E. Elmer. These are from regions little or not at all explored by forest officers and contain a large percentage of new species. Besides scores of wood samples identified, of which no special record was kept, 118 trade samples were added to the collections, many with new names, of which a large percentage were from provinces not previously well represented. To the collection of foreign wood specimens 44 numbers were added, the total now being nearly 1,700.

Phenological reports to the number of 149, containing 1,002 tree names, were received and the new names found in them recorded in the card index of common names.

OTHER ACCESSIONS.

New floor specimens (logs) to the number of 13, all of species new to the collections, have been worked up and installed in the museum. Fifteen new 10-foot planks have been received and installed, besides a number of planks worked up from various lots of old and well-seasoned material acquired during the last few years. Also, a beginning was made to work up a new and more complete set of 6-foot panels of all available material. These now number 81 and are being mounted along the corridors of the offices of the second floor, where they serve at once for ready reference in case of inquiries and as a most appropriate form of ornament.

HAND SPECIMENS AND OTHER SHOP WORK.

The preparation of duplicate hand specimens for sale and distribution, from seasoned material, has kept even pace with other work, so that there are in stock now about 300 species. Over 6,000 hand specimens were distributed during the year, of which number 821 were sold, 2,180 distributed gratis, and 2,736 furnished to the Forest School. Besides specimens furnished to Government agencies and interested private parties in the Islands, they have gone to the following countries: Australia, Borneo, China, Federated Malay States, Hongkong, India, Japan, Mexico, and the United States.

Several stands and racks have been made for exhibiting bamboos, rattans and other minor products in the museum. Metric scaling sticks of native woods were made and furnished to all forest stations where rangers have to do any scaling of logs. Owing to war conditions it has become increasingly difficult and very much more expensive to obtain office furniture, so during

the past year all new tables, typewriter stands, etc., required not only for the Manila office but also for forest stations, were made in the shop. While shop-made furniture costs not much less than commercial articles, it has the advantages of being more solidly constructed and more neatly finished than similar articles purchased in previous years. Moreover, it is made almost entirely of thoroughly seasoned material, which is rarely the case with any but the finest grades of furniture from private shops.

IDENTIFICATION, INSPECTION, AND GRADING.

As mentioned above, large numbers of specimens submitted by Government agents and private parties were identified. About 25,000 railroad ties were identified and inspected for railroad companies and other parties. Export lumber to the amount of 500,000 board feet was inspected for grade and species for several private firms.

COÖPERATION.

As mentioned above, there was begun this year a more active coöperation with the Bureau of Internal Revenue in the matter of proper identification of the timber and other products shipped into the Manila market. The Bureau of Internal Revenue agents were furnished a carefully selected set of typical specimens of all the species of woods that commonly come into the market in logs, as well as instructions regarding conspicuous and distinctive features of common species, such as smell, hardness, color, colored deposits in pores, oily or resinous look or feel, etc. In addition to this, rangers from the office accompanied them to identify piece by piece entire lots of timber or large firewood. Several good results have been thus obtained. In the first place, both the Bureau of Internal Revenue agents and the lumbermen have learned in many cases to recognize by their correct official and commercial names such woods as often came in under little-known, local names. Second, this knowledge has begun to filter back even to the wood-cutters and licensees in the provinces, so that the different woods are being more and more listed by their official names in the original invoices, thus simplifying all necessary recording and assessing of forest charges. Finally, because of this better understanding on the part of both revenue agents and licensees, woods that were manifested by little-known, local names and were formerly assessed only as fourth-group timber, are now properly identified and assessed in the third, second, and (in a few cases), even first group, with the result that by a few hours' work the agents and rangers have often added to

the proper Government revenues more than their combined salaries for the day.

As in previous years, a number of exhibits were put up in coöperation with the Bureau of Education at Arbor Day and Garden Day celebrations. The most important of these was the Forestry exhibit at the second annual fair of the Central Luzon Agricultural School in Nueva Ecija. Similar exhibits were shipped to several provincial fairs.

REVISION OF GROUPS OF TIMBER TREES.

The proposed regrouping worked out the previous year has been brought up to date as regards both common names and scientific nomenclature and was approved in December. It was published in the Official Gazette in January, 1919, to go into effect on February 1. There was also begun a new tabulation of all local synonyms on record for woods of the first three groups, arranged in alphabetic order, which will be sent out to all internal revenue agents as soon as possible after the promulgation of the new grouping.

COLLECTING AND RECORDING DATA.

A considerable amount of time has been spent in compiling and recording data directly or indirectly connected with herbarium and wood collections and the distribution and local names of species. The local names and distribution of all the tree species of the mangrove swamps have been complied, from herbarium sheets and other sources, for a forthcoming publication. The same work has been completed for the bamboos, for the same purpose. A beginning has also been made toward compiling and maintaining complete lists of the herbarium material in the Bureau of Science of all tree species and other plants furnishing important minor products. These lists will serve in the first place for revising the scientific names of all wood specimens bearing herbarium numbers and also for ready reference when it is desired to know at once the entire distribution of a species without going to the herbarium. This work has been completed for nearly 20 tree families and will be continued as rapidly as possible.

WEIGHTS AND DURABILITY OF WOODS.

Owing to pressure of other work and lack of personnel, it was impossible to work up into form for publication the tables of weights and the data on durability. Meanwhile, some other material has been added and the table will be published during the year 1919.

CATALOG.

A large amount of material has been added during the year to the collection of minor products, some of which has been recorded progressively in the catalog, but otherwise little progress has been made on this work. However, much of the material has been classified during the year and so arranged, as to facilitate greatly the future work of listing. It is expected the work will be completed within the year.

CLERICAL WORK.

Outside of the routine clerical work of the office, much special work was necessary during the year in relabeling floor specimens and planks in the museum, and especially the smaller wood specimens in the office. Three important botanical works were published during the year, all of them involving changes in the scientific nomenclature of numerous tree species, so that it was necessary to relabel hundreds of specimens of all kinds. Also, in order to bring Bulletin No. 14 up to date in this regard, a list of the required changes in names was prepared to send to all forest officers and others using the bulletin and to insert in copies for future distribution.

DIVISION OF INVESTIGATION.

The chief activity of the Division of Investigation during the year 1918 was directed toward the preparation of a series of bulletins on minor forest products and a flora of the woody plants of the Mount Maquiling region.

Minor forest products is a term that includes all forests products other than timber. In the Philippines these minor forest products are of very great commercial value and the Bureau of Forestry is continually receiving inquiries concerning them. While the Bureau has been collecting information on these subjects for many years, there was, up to the beginning of the year 1918, practically nothing in print and such little as existed, was very much out of date. For these reasons, it seemed highly desirable to prepare a series of bulletins on minor forest products which would give valuable information concerning them and serve as texts in the School of Forestry.

BAMBOOS.

Bulletin No. 15, prepared in 1918, gives a general account of Philippine bamboos, keys to the species, descriptions and pictures of the different species, and notes on their uses; also an

account of the growth of bamboos in plantations, the rates of growth of mature bamboos, and data on the cost of harvesting.

PAPER.

Bulletin No. 16, prepared in 1918, gives an account of the Philippine forest products that can be used as sources of paper pulp. This subject is one of considerable interest at the present time, as large quantities of paper are used in the Philippines and there is a large, potential supply of pulp material in the Archipelago.

MANGROVE SWAMPS.

Bulletin No. 17, also prepared in 1918, gives a general account of the Philippine mangrove swamps, keys to the species, descriptions and pictures of the various species, and their economic uses. The description of the species is followed by sections dealing with stands of timber in the swamps, the growth of bakauan in plantations, the value of the different mangrove swamp species as firewood, the use of mangrove swamp barks as tanning material, and the economic uses and method of cultivation of the nipa palm. This bulletin should be of great value, as the mangrove swamps in the Philippine Islands occupy between 400,000 and 500,000 hectares, and are a very valuable asset to both people and Government.

PALMS.

During the year 1918 the work of the preparation of a bulletin on palms was largely completed, and this publication will be issued during 1919. It includes a general description of the Philippine palms, keys to, and descriptions of, the species, as well as pictures of the more valuable ones. The economic uses of all the palms, including rattans, are very fully treated.

FIBERS.

The Philippine forests contain a great variety of fiber plants used in the manufacture of cordage, baskets, mats, bags, furniture, and a great many other objects. During the year 1918 considerable work was done toward the completion of a bulletin on this subject, which will be printed during 1919.

OILS, RESINS, AND GUMS.

Oils, resins, and gums in the Philippine forests are numerous and a number of them, such as almaciga, elemi, and lumbang are of great importance. Others are of considerable potential value. During 1918 the bulletin on this subject was more than half completed and will be published in 1919.

MISCELLANEOUS MINOR FOREST PRODUCTS.

The Philippine Forests contain many minor forest products other than those discussed above. These include medicinal plants, dyes, edible plants, ornamentals, poisons, soap substitutes, glues, etc. During the year 1918 considerable progress was made in the preparation of data on these various subjects. These will also be issued during the year 1919.

MINOR FOREST-PRODUCT BULLETINS.

There has long been need of a bulletin dealing with all the minor forest products of the Philippines. The work described above is in preparation for such a publication, which it is planned to issue during the year 1919 in three volumes; the first two dealing with plant and the last with animal products.

The first volume will be reprinted from the plates used for the bulletins on bamboos, paper materials, mangroves swamps, palms, and fibers. There will be, of course, such additions as will be necessary to bring the subject absolutely up to date. It has been considered advisable to print the various sections separately, as well as in the form of a general bulletin. For many purposes, including instruction in the Forest School, a complete account of the minor forest products will be essential; while many people will desire only a single section, and considerable expense will be saved if it is possible to issue to such only the particular section in which they are interested.

Volume two will include oils, resins, and gums, medicinal plants, ornamentals, edible plants, dyes, glues, poisons, and other miscellaneous products. Only one section of this volume will be issued separately; that is, the section on oils, resins, and gums.

Volume three, which has not progressed as rapidly as the others, will include animal products. It will contain an account of the useful birds, mammals, reptiles, insects, and crustacea.

FLORA OF MOUNT MAQUILING.

The students at the School of Forestry have long been handicapped by the lack of a flora to help identify the tree species growing on Mount Maquiling. During 1918, all the time, other than teaching hours, of one of the staff of the Division of Investigation was employed on this project and very considerable progress made toward the preparation of the manuscript. As this work will contain descriptions of the trees in a very representative area, it will not only enable the students to identify the trees which they meet in the forest of Mount Maquiling; but also serve as the basis for a study of the trees themselves.

This study is, of course, one of the most important parts of the course in forestry.

SILVICULTURE.

(1) *Nurseries.*—The site and size of the nurseries have proved to be very satisfactory, as they have been during the last three years. Fifteen species were experimented with in the nursery in the past year.

(2) *Plantations.*—During the past year 3¼ hectares were added to the plantations, making a total of 80 hectares now planted with forest species. The cost of managing the nurseries during the past year amounted to ₱441.46 and for the plantations, ₱703.40, or a total of ₱1,144.86.

(3) *Measurement of best trees.*—A large number of measurements of the best trees of the different species have been taken as heretofore. They show the average rate of growth of the different species of trees, the best results that can be expected, and whether or not those trees which begin to grow best continue the best. On account of the large size of the plantations and the fact that the trees are of considerable age, measurements are now being made twice a year instead of four times as formerly.

(4) *Growth studies.*—(*a*) Measurements begun in 1912 and 1914 on a large number of trees in the Maquiling Forest Reserve have been continued. Measurements have also been taken of the trees in the Paete Forest, which were first measured in 1913. Measurements on additional trees have also been begun. These measurements now cover a sufficient period to be very valuable in giving an idea of the rates of growth in these two forests, and it is intended to present them in published form to supplement previous data published by the employees of this Bureau.

(*b*) The above measurements were taken, as well as the rate of growth of individual trees on other plantations. All the trees on a certain area are measured and the rest determined. These measurements have been continued as formerly.

(5) *Silvical leaflets.*—During the past year, silvical leaflets dealing with 75 new species have been prepared, thus bringing the total number of species treated up to 195. These leaflets contain a great amount of information about the habits and habitats of the trees and are intended to furnish a basis for the treatment of the silvicultural requirements of Philippine forest trees.

(6) *Cuttings.*—During the past year 69 species were used in reproducing by cuttings. These were, for the most part, species

which had not been previously tried, but included some that were not successful in past years.

(7) *Seedlings.*—Part of the practice of past years has been the gathering of seedlings from the forest and planting them in the plantations to determine the possibility of using this method in reforestation work. During the past year 18 new species were handled, making a total of 55.

(8) *Reproduction studies.*—The study of reproduction on cut-over forest areas begun in 1913 has been continued as heretofore.

(9) *Lumbang studies.*—As a result of repeated inquiries on the value of lumbang oil, studies have been carried on to determine the yield of trees of different ages in the open and in the stand. Data is being gathered on the individual bearing of all trees during heavy yield and light yield years in order to form a basis for seed selection.

(10) *Cost records.*—During the past year considerable progress was made in determining the actual cost of reforestation work.

FOREST MANAGEMENT, ENGINEERING, AND UTILIZATION.

(1) *Durability tests.*—Work has been continued as formerly. Durability tests of wood species have been kept up and tests on treated and untreated bamboo started.

(2) *Wood preservation.*—As a result of the war activity, studies have been developed wherein the creosotes and tars derived from the distillation of coconut shell show promise of being excellent preservative material for woods in the tropics. Experiments will be carried on in the coming year, provided enough of the distillate creosotes and tars can be obtained.

(3) *Map of the plantations.*—A new map on the scale of 1–1,000 is being prepared and will soon be finished, which will locate the various plots and species much more accurately than has been done before.

THE WORK IN BAGUIO.

The work in Baguio, which is the hill station of the Philippine Islands and the headquarters of District No. 3, comprises the Baguio working circle and the general district administration. The work in the circle is divided into three subheads: general administration; special work on improvement, parks, nurseries and city work; and reforestation. The circle comprises the pine forest within the city reservation, including the mineral district outside the reservation, and all pine stands within a radius of 20 kilometres from Baguio proper.

Data were gathered during the past year for a working plan of the Baguio working circle. The plan is practically completed.

NURSERY.

In the nursery 16,000 cuttings of desirable species were planted this year. Several thousand native herbaceous perennials are now available. The use of native herbaceous perennials gives quick and permanent results in the city ornamentation. The nursery and transplant areas are now sufficiently ample for the work, as most of the villas and private grounds have been fully supplied with plant material and the present nursery stock will be used mostly in the city and park improvement work. A large seed and propagating house has been built to replace the old one. Two new bridges were built on the nursery grounds and the drives and gutters widened and improved. With the construction of a manure tank at the nursery, it is now possible to use stable manure in the planting operations.

Economic trees are being grown at the nursery, the *Cinchona* being of special interest. Twenty-two of these trees are in a healthy condition and over 50 centimeters tall, although a few had to be pruned back because of dying tops. Every effort is being made to bring these plants through, as it is hoped they will furnish a future source of seed. Seeds of economic trees from the United States have given very poor results. For the planting work in 1919, there are now available 25,000 trees, 5,000 shrubs, and 15,000 herbs and vines, comprising in all 337 species and varieties. New trials will be made with ornamentals from Japan, the United States, and Australia.

Excluding 45,000 cuttings used in reforestation work, 4,680 plants were issued from the nursery, of which 1,120 were issued gratis to private individuals, while the rest was used in city and reservation beautification.

CITY AND PARK IMPROVEMENTS.

Ornamental colored shrubs and herbs were planted in masses in Forbes Park and steps were taken for the protection of native birds, at least within the park area, by prohibiting therein all use of air guns, etc., and by building bird houses and shelters to induce the birds to live in and about the park. In the city work practically all the road trees were closely pruned for the typhoon season, although a goodly number along Session Road were blown down, not so much because of the severity of the typhoon as from serious attack of root rot. Plantings were carried on by the Bureau personnel in and about City Hall, Wright Park, Burnham Park, and in the city cemetery.

Considerable trouble has been caused the Bureau by owners of lots not having their boundaries or corners located so as to be readily identified; this has resulted in some cases in the cutting of trees by firewood licensees on private property. Owners of lots have complained to the Bureau and requested action, but, inasmuch as the Bureau personnel is not in a position to locate lot boundaries, complainants have been requested to locate at least the four corners of their property as a guide and to take civil action for trespass.

THE FOREST SCHOOL.

The work at the Forest School during the past year was handicapped by the lack of equipment and a full teaching staff. Vacant positions on the teaching staff could not be filled as no men fitted were available because of the organization of various engineering regiments in the United States. Several Filipino instructors entered the Philippine Guard and the work was kept up by the remaining staff taking on additional work.

If the positions now vacant can be filled, it is hoped that by next year an advanced course leading to a bachelor's degree in forestry can be given, provided the College of Agriculture will coöperate in the instruction and use of the laboratories in physics and chemistry.

The field work of the senior class was delayed as it was planned to use the seniors in conjunction with a big party of experienced rangers on a large reconnaissance, but due to the lack of funds this work will be carried on in the early part of next year before their graduation.

The junior class of the Forest School reported for the summer term on April 15. They were given the usual course in botany, which familiarized them with botanical terms and acquainted them with the more important families and genera. The regular school work was taken up in June with an attendance of twenty-two seniors and twenty-four juniors. Of these, four students were from China. During the first semester, two forestry students were dropped because of difficulty in keeping up with the work. They were handicapped by their lack of training in English. These students were graduates of private schools where Spanish is the principal language.

The Forest School was closed during the entire month of November because of the trancazo epidemic. At one time there were only 13 students strong enough to look after those who were sick. They maintained their system of reliefs and had the sole care of the sick. As the University doctor had not been



Road leading to the Division of Investigation and Forest School, Los Baños, Laguna. On both sides are forest plantations made by the Division of Investigation since 1911.



Student quarters, Forest School, Los Baños, Laguna.

PLATE II.

UNIV. OF MICH.

on duty at the College of Agriculture since the first of July, it was necessary to call in an outside physician for advice and assistance. The school was exceedingly fortunate in having escaped so easily, as only three cases developed dangerous symptoms. By careful nursing, these men recovered without getting pneumonia. The way in which these students took hold of their hospital duties speaks well for the future development of public spirit in the Philippines.

The students carried on their own mess as formerly with an instructor detailed to supervise. Wholesome and nourishing food was furnished by the elected stewards at reasonable price. To augment their mess the students planted a garden and worked it during their spare time.

REFORESTATION.

Due to lack of money, extensive reforestation as planned, was impossible during the past year. But with what money was available, preliminary work was done in the Ilocos Provinces by the ranger in charge of reforestation work, in coöperation with the personnel of that district. The preliminary work consisted in visiting the municipalities and conferring with municipal officials and people, setting aside small plots ranging not over 20 hectares and making clear the terms of coöperation to the municipal authorities. The terms were as follows:

Volunteer planters for the planting period to be secured from the adult residents of the town by the municipal officials. The necessary labor to be hired to carry out the desired amount of planting. At least one guard to be hired by the municipality to keep fires out of the plantations during the dry months. The Bureau of Forestry to furnish the seed and the technical men necessary to carry on the work cheaply and successfully.

As a result, out of the 18 municipalities visited by men of the Bureau of Forestry, 12 forwarded resolutions to the effect that they were willing to coöperate. Approximately 200 hectares were set aside by these municipalities for reforestation. In all 53 cavans of seed were distributed for this purpose. Ipil-ipil seed was used for planting. Small nursery plots are to be established in coöperation with the public schools in their garden work and seed of timber-producing species furnished which, in the opinion of the Bureau, will do well in that locality. The school children are to take care of these nurseries to produce transplants and, after the Ipil-ipil has more or less killed out the cogon, to transplant the nursery stock, during their Arbor Day festivities, to the areas already planted up with Ipil-ipil.

Municipal officials as a whole in the 12 municipalities were very enthusiastic and will no doubt do everything possible to coöperate, the only possible danger being that when labor is necessary it may not be forthcoming. Periodical visits will be paid by the district force to see that care is taken of the plantations now started. Similar work is proposed for the Provinces of La Union and Zambales, but only the preliminary steps have been taken, which consisted of interviewing the municipal officials and outlining the work of the coöperation.

TALISAY–MINGLANILLA REFORESTATION PROJECT, CEBU.

The following table shows the amount of work performed since the beginning of this project in June, 1916.

Year.	Area under Bureau of Forestry.	Area handled.		Area of cogonal planted.		Area caiñgin planted.		Amount of Ipil-ipil seeds broadcasted.
	Has. Ap., 4,095	*Has.*	*Per cent.*	*Has.*	*Per cent.*	*Has.*	*Per cent.*	*Liters.*
1916		666	16.26	352	8.59	52.0	1.27	9,342
1917		971	23.61	854	20.60	67.3	1.65	20,640
1918		1360	33.24	220	5.41	318.7	7.78	5,280
Totals		2,997	73.11	1,416	34.60	438.0	10.70	35,362

Year.	Number of—				Distance boundary.		Distance horse trail constructed.	Distance of foot trail constructed.
	Ipil-ipil seedlings planted.	Lumbang seeds sown.	Bagilumbang seeds sown.	Seedlings set out.	Cleaned.	Planted.		
					Kms.	*Kms.*	*Kms.*	*Kms.*
1916	104,841	56,920	163,930	None	17.2	14.1	.915	3.114
1917	10,628	50,000	245,170	4,136	6.3	6.3	None	None.
1918	None	18,000	393,450	7,791	None	None	None	None.
Totals	115,469	120,920	802,550	11,927	23.5	20.4	.915	3.114

From the above tables, it may be observed that during the past year no work had been performed on trail construction, establishment of boundaries and planting of Ipil-ipil seedlings, due to lack of funds. Also, for the same reason, only 220 hectares of cogonal area were broadcasted with Ipil-ipil seeds.

To offset this, however, there were more caiñgins replanted in 1918 than during the two previous years, the caiñgin area planted being 318.7 hectares as against a total of 119.3 hectares for 1916 and 1917.

At the beginning of last year, the available money for the project was ₱2,900 and the expenditures during the entire year only ₱1,431.42. In view of the amount of work performed with such a small expenditure, it is considered that the administration of this project has been carried out remarkably well.

GENERAL ATTITUDE OF THE SURROUNDING POPULATION.

During the first two years of work in establishing this project, there was a great deal of trouble with squatters, the trouble at times assuming serious proportions, due to the ignorance of the people concerned and their misconception of their rights to the land they were occupying. During 1918, however, there was little or no opposition because it was the policy of the personnel attached to this project to visit the houses of these squatters and explain to them the purpose of the project and the status of the land claimed by them. The coöperation of the municipal officials of Talisay and Minglanilla in the pacification of the squatters was also a very big factor in the peaceful settlement of the question.

WORK PLANNED FOR 1919.

No broadcasting can be done during the next year due to lack of funds. It will be possible, however, to plant in the caiñgin areas the seedlings now growing in the forest nurseries.

BAGUIO REFORESTATION PROJECT.

As this past year was a very poor one in regard to seed production of pine, pine seedlings were gathered with earth balls at an average cost of ₱1 per thousand plants. These were planted in the nursery at 25 centavos per thousand, exclusive of the cost of preparing the ground. Transplants of pine were planted in grassland areas, the transplants being from 30 to 60 centimeters in height and the planting space one and a half meters, at a cost of ₱19.88 per thousand. Tests are being carried out with the local hardwood known as Idog (*Viburnum odoratissimum*) which is used by the natives for hedges and fences. Reforestation work was also continued at the Antamok Creek Source, where 45,000 cuttings were planted during the past year and a count was made of the plantings of the previous year, which gives a percentage of 75 as still living and doing well. Steps were taken to close the planting area to pasturing and a guard was stationed in the neighborhood to keep out fires and animals.

DIVISION OF SAWMILLS AND UTILIZATION.

PERSONNEL.

During the year this division lost one field assistant and four rangers by resignation, dismissal, and death, in addition to three rangers who entered the officers' training camp. The assistant forester assigned to the division was also transferred to aid in handling the large amount of work in the division of forest lands and maps.

The personnel of the division now consists of one forester, one lumber inspector and eighteen rangers. The majority of the rangers are called upon to perform general administrative work under the other divisions of the Bureau in addition to their scaling and concession work, so that time for special studies and grading instruction has been greatly curtailed.

SCALING.

At the time the law providing for the manifesting of timber in the log was passed, arrangements were made to have all the logs scaled by rangers only at the larger mills; while periodic trips were made by the rangers to the smaller mills to scale defective logs, the mill-owners being required to measure and manifest their logs between those visits.

This arrangement, which was made because of the shortage of rangers to handle the work, has never been satisfactory to the interests of either the Bureau or the licensee and new stations have been established as rapidly as men were available in order to provide a permanent scaler for each mill.

The presence of more or less defects in all logs made the manifests, without proper deduction by the companies, unfair to them, and this unsupervised measuring gave rise on some occasions to careless or fraudulent measurements to the loss of the Government.

With the loss of a number of well-trained scalers during the past year, the need of men to carry on this work is again being greatly felt. To develop proper judgment in deducting for defects, the men require at least a month's training under a competent instructor. This training has not been possible to give in all cases with the urgent need for new men in the field to fill the vacancies created by the Philippine Guard and the growing demands in the Bureau work.

The large amount of computation entailed in preparing scale reports renders the work monotonous and unpleasant to many of the men, who prefer the variety of the other forms of field work for which they were originally trained. In order to relieve the rangers for general administrative and investigation work for which they were trained at the Forest School, the appointment of guard scalers is being adopted. These men are generally of grammar and intermediate schooling, who have acquired some knowledge of timber through experience in sawmill and logging work. After receiving thorough training in log defects and the determination of utilization of waste in the mills, they are assigned to scaling work under the supervision of a ranger, experienced in the work. Four of these guard scalers are now

assisting the rangers in the scaling and computation work at the larger mills, and more are being selected and trained to assume these duties at all the stations having a large amount of scaling work.

LUMBER GRADING.

The demands made on the Bureau personnel for administrative work by the loss of rangers to the Philippine Guard officers' training camp prevented much further development in grading work.

Several orders for local concerns were inspected by rangers trained during 1917, and five more rangers were given preliminary instruction in classifying the grades other than export at the various mills in southern Mindanao, making a total of 10 rangers who have had preliminary training in grading work. As noted in the report for 1917, the five men receiving instruction during that year also had practice in grading export stock and with some months additional practice and training should develop into efficient inspectors.

With the return of the rangers from the Philippine Guard camp and the entry of the new class from the Forest School, it is hoped that during the coming year further steps can be taken in developing an efficient corps of ranger graders to work under the supervision of an experienced lumber inspector.

UTILIZATION.

During the past year the rangers assigned to the study of grading spent some time in gathering data on the layouts and machinery of the different mills visited by them and securing figures on the cost of operation. This data is being gathered from the various mills with special reference to the larger and best managed mills in order to obtain figures showing the general cost of lumber production in the Islands. Figures so far obtained indicate an everage cost of ₱35 per thousand board feet at the mills.

Complete records are also kept, as far as the figures can be obtained from the companies, of the species cut, the mill output and the shipments to various markets, both local and foreign.

The importation of foreign lumber and possibilities of replacement with local species are being studied for the purpose of creating, as far as possible, a clear field for native lumber as against American and other woods which have entered the Islands in competition more or less continuously since the establishment of the lumber industry here.

LUMBERING.

The sharp revival in lumbering activities and improvement in the market which began in 1917 has continued through the greater part of this year, and while the signing of the armistice in Europe in November created some disturbance and uncertainty among the lumber dealers, conditions have remained good, with excellent prospects for the coming year.

In spite of a large decrease in exports owing to the demand on shipping for other products and the heavy freight rates, the larger mills have continued to operate full time and, in some cases, over time, with a resulting production of some 62,000,000 board feet for the seven larger concession areas as compared to 56,000,000 board feet in 1917. The total production for all the mills in the Islands was approximately 75,000,000 board feet as compared to 60,000,000 board feet in 1917.

While only one new mill was built during the year, replacing one burned in 1915, a second was completed and put in operation and five changed ownership and were put in better running order with an increased and steady output. One of these having cut over the area on which it was located was dismantled and is now being set up on a piece of private forest where it will also be able to utilize government timber.

FOREIGN MARKETS.

In foreign sales, lumbermen have reported numerous inquiries and orders, many of which they have been unable to meet owing to the continued shortage of bottoms during the greater part of the year.

Shipments of lumber during 1918 have decreased some 12,000 cubic meters as compared with 1917, but this can largely be accounted for by the assignment of practically all shipping space to other local products, hemp, copra, oil, etc., and the very high freight rates met with. With the release of shipping for other than war purposes which can be looked for during the coming year, prospects for developing large foreign sales are excellent. The China market, which is capable of being developed into one of the largest purchasers of Philippine lumber, can be supplied more readily with the release of shipping; and a reduction in freight rates will permit the placing of lumber in that country at marketable prices.

An indication of the possibilities of development of the markets in China, particularly of the Douglas Fir market in South China, is found in the United States Commerce Reports of

November and December, 1918, and in reports of the lumber markets in Tientsin and Hankow. The following extracts are taken from the latter report:

Hongkong is not so large a market for softwood lumber as Shanghai. Various factors contributed to distinguish the timber trade of Hongkong from that of Central and North China. Owing to the more tropical climate of the south, a wood is required that will not shrink and that is able to resist the ravages of white ants and other insects. In South China, American and Japanese softwood lumber has also to face stronger competition from the various hardwood timbers of the East, such as teak, Philippine, and Borneo woods.

CHIEF FOREIGN WOODS USED.

Owing to high freights and other causes the quantity of Douglas fir imported last year was smaller than usual and can not be taken as representative of the requirements of the markets for this wood. A large amount of teakwood is used by the shipbuilding and repairing companies for decking and other purposes. Teak is also used for making furniture. This timber is imported from Siam and Burma, usually in the form of logs to be sawn up as required. *The Philippine Islands produce timber of excellent quality. Lauan timber from the Philippines is one of the chief competitors of Douglas fir, while Philippine Apitong is also used largely for flooring. A small quantity of lumbayao is also imported,* principally for the manufacture of furniture.

Douglas fir imports consist almost entirely of heavy beams, planks, boards, and bridge timber.

USES OF DOUGLAS FIR.

The Douglas fir imported into Hongkong is used by the shipbuilding and repairing companies chiefly for the lining of cargo holds and for interior work in cabins, ceilings, bunk sides, etc. In the construction of houses, Oregon Pine is employed mainly for siding. The Chinese require only rough timber for building purposes. Oregon Pine is not suitable for flooring on account of the ravages of white ants. A fairly large amount of Oregon Pine is used for staging. Junks and sampans have been made from this wood, but Foochow Pine is generally used for this purpose.

The average buying price for Douglas fir before the war ranged from $18 to $22 gold per 1,000 superficial feet landed in Hongkong. Owing to high freights across the Pacific, the present price is around $99 gold. This price is very high compared with that of other woods. As a result, a larger proportion of Foochow Pine has been sold. In normal time Douglas fir can compete with Foochow Pine in price and at the same time is superior in quality. *Lauan timber may be considered the chief competitor of Douglas fir in the Hongkong market.* Other things being equal, lauan is usually preferred, owing to the poor grades of Douglas fir imported. In 1916 both woods were selling for about 6 cents Mexican per foot. As a rule, Douglas fir is cheaper and for certain purposes is found more suitable. California redwood is a favored timber, but generally its price is too high. It is not affected by the white-ant pest and the opinion was expressed that British Columbia red cedar also should prove a suitable wood for the South China market for the same reason. It was reported that the prices of

British Columbia lumber have been too high as compared with lumber from Oregon and Washington, but this may be attributed to the fact that the Canadian mills have never been properly organized for this business.

HANDLING OF LUMBER IMPORT.

The trade in timber with Hongkong is in the hands of a few firms, most of whom have long-established connections with mills on the Pacific Coast of North America and in other producing countries. These firms have their own piling grounds at the principal centers and well-organized systems of distribution through native dealers covering all important points in the interior.

As Philippine woods can be substituted largely for the above-mentioned uses of Oregon Pine, it seems evident that Philippine and Borneo woods, together with teak and the cheaper Foochow Pine, should occupy principal positions in this important market.

In northern China the reports show that softwoods from America, Japan and China, together with oak from Japan, at present occupy the chief place in the lumber market, although the high freight rates have greatly reduced imports from America. Philippine woods are chiefly imported into Tientsin and vicinity for flooring and interior finish.

However, the importation of 733,172 cubic feet of hardwoods into Tientsin and 188,309 cubic feet into Hankow during 1917, when transportation was difficult and expensive, together with the variety of uses for which Philippine lumber is useful, indicates the excellent prospects available for an active campaign in this region.

Inquiries from Japan, Australia, and South Africa during the past year, while not giving special promise of much business at present, should lead to further introduction of Philippine lumber in those countries and the establishment of a permanent trade.

MARKETS.

With a total production of some 75,000,000 board feet from the sawmills of the Islands, the local markets have continued to be the chief purchasers, taking 91 per cent as against 80 per cent during the previous year, or about 68,000,000 board feet.

In addition to the native lumber, there have been imports amounting to 14,879 cubic meters or 6,308,700 board feet from the United States and other countries, of which 7,387 cubic meters or 3,135,000 board feet were Oregon Pine and Redwood, as compared with 2,768 cubic meters or 1,174,000 board feet in 1917.

The amount and value of lumber and timber exports for 1918, as compared with 1917, are shown in the following table:

	1918			1917		
	Cubic meters.	Board feet.	Value in pesos.	Cubic meters.	Board feet.	Value in pesos.
To United States:						
Timber	31	13,144	1,015			
Lumber	6,999	2,967,576	376,153	12,488	5,294,912	483,215
Total	7,030	2,980,720	377,168	12,488	5,294,912	483,215
To Hongkong:						
Timber	169	71,656	10,973	1,166	494,384	72,842
Lumber	3,858	1,635,792	80,066	8,310	3,523,440	215,645
Total	4,027	1,707,448	91,044	9,476	4,017,824	288,487
To China:						
Timber				223	94,552	8,730
Lumber	5,477	2,322,248	166,084	6,453	2,736,072	121,009
Total	5,477	2,322,248	166,084	6,676	2,830,624	129,739
To Japan:						
Timber				26	11,024	1,501
Lumber	10	4,240	1,453	23	9,752	1,995
Total	10	4,240	1,453	49	20,776	3,496
To Australasia:						
Lumber	13	5,512	436	52	22,050	1,646
To Guam:						
Lumber	11	4,664	810			
Grand total	16,568	7,024,832	636,985	28,741	12,186,186	906,583

Although a certain amount of the increase in Pine imports may be attributed to failure of local purchasers to appreciate the comparative qualities of pine and local lumber, a large portion of the lumber has not been sold in the Islands, but has been reëxported to India and the Dutch Indies.

Experiments carried on by the Bureau of Forestry during the past 10 years indicate that Oregon Pine and Redwood are no more than equal to and, in some cases, poorer than common native lumber in point of durability and structural qualities.

As the continued use of American lumber appears to be largely a matter of more familiarity with many users and partly in consequence of the failure of local mills to cut some of the larger sizes required for special purposes, a proper campaign by the lumbermen for the business formerly held by foreign lumber should do away with this competition.

The U. S. Army Quartermaster Corps was formerly probably the largest user of Oregon Pine and Redwood in the Islands, but after carefully investigating the records and comparing them

with those of the native species, the Department has turned entirely to native lumber.

The contract awarded by the Quartermaster during 1917 for native lumber was completed during the present year and during the latter part of the year, new bids were called for and another contract for 3,000,000 board feet awarded to a local company.

Imports from the United States, January to December, 1918.

	Cubic meters.	Board feet.	Value in pesos.	Duty.	Totals. Cubic meters.	Board feet.	Value in pesos.	Duty.
Ties, 1,305	72	30,450	₱659		169	71,578	₱5,559	
Timber	97	41,128	4,900					
Pine lumber	4,908	2,080,992	138,962		6,235	2,643,640	202,008	₱2,667
	1,327	562,648	63,046	₱2,667				
Redwood	1,152	488,448	28,504					
Cedar lumber	459	211,576	7,273					
Cedar box shooks			64,383					
All other lumber	3,193	1,353,832	90,715		4,008	1,733,312	117,084	2,179
	895	379,480	26,369	2,179				
Total lumber	11,974	5,076,976	419,252	4,846				

OTHER COUNTRIES.

	Cubic meters.	Board feet.	Value in pesos.	Duty.	From—
Miscellaneous timber	7	2,968	₱680	₱14	Canada.
Miscellaneous lumber	742	314,608	16,357	1,485	
Miscellaneous timber	17	7,208	221	32	China.
Miscellaneous lumber	46	19,504	694	136	
Pine lumber	17	7,208	608	34	Japan.
Cedar shooks			3,889	583	
Do			1,738	434	Spain.
Cedar timber	50	21,200	1,137	99	Dutch Indies.
Miscellaneous lumber	26	11,024	752	53	French Indies.
Do	120	50,880	3,456	343	British Indies.
Do	1,664	705,536	21,470	429	British West Indies.
Timber	20	8,480	1,589	41	Germany.
Pine lumber	2	848	15	4	
Total	2,736	1,159,064	53,591	3,686	

TOTAL OF ABOVE TABLES.

	Other countries. Cubic meters.	Board feet.	Value in pesos.	United States. Cubic meters.	Board feet.	Value in pesos.
Miscellaneous timber	44	18,656	₱2,490	169	71,578	₱5,559
Cedar timber	75	31,800	2,122			
Miscellaneous lumber	2,598	1,101,552	42,729	4,088	1,733,312	117,084
Pine lumber	19	8,056	623	6,235	2,643,640	202,008
Cedar box shooks			5,627			64,383
Cedar lumber				499	211,576	7,273
Redwood lumber				1,152	488,448	28,504
Total	2,736	1,159,064	53,591	12,143	5,148,554	424,811
Grand total of imports	14,879—6,307,618—478,402					

Imports of Oregon Pine from United States; past 5 years.

Year.	Cubic meters.	Board feet.	Value in pesos.
1914	30,441	12,906,984	₱650,292
1915	3,281	1,391,144	58,128
1916	1,952	827,648	58,765
1917	2,768	1,173,632	110,924
1918	6,235	2,643,640	202,068
Total	44,677	18,943,048	1,080,117

While Manila is the chief lumber market in the Islands owing to its importance as a distributing center, the ports of Cebu and Iloilo in the Visayas, and Zamboanga in Mindanao received large shipments during the year, in addition to the local demand supplied directly from the sawmills and smaller licensees.

The steady settlement and development of Davao Province has led to the establishment of two yards in the town of Davao, which is rapidly developing into an important center.

In spite of the uncertainty created among some of the lumber dealers by the signing of the armistice in Europe, prices have continued high throughout the year with increases over 1917 of 20 to 30 per cent and in some cases as high as 40 and 50 per cent.

DIVISION OF FOREST LANDS AND MAPS.

SECTION OF PUBLIC FOREST-LANDS CASES.

Several short-comings have been observed in handling the subjects pertaining to this section, due mainly to the lack of understanding and coöperation between this Bureau and other Government branches connected with the registration of titles to lands claimed by private persons. In order to obviate these weak points, it is suggested that the following coöperative plan be recommended to the Director of Lands and the Attorney-General respectively:

Bureau of Lands.—Both Government and private qualified surveyors should be required to sketch on the plans to be registered all the different features of the land such as roads, trails, rivers, creeks, hills, etc., and especially the soil cover, by indicating the different areas as follows:

Forest or bosque	Soil covered with timber of whatever species.
Brush or matorral	Soil covered with shrubs or brush or mixed with cogon, i. e., "Parang".

Uncultivated or inculto	Uncultivated land.
Pasture or grass Pastos o cogonal	Soil covered with grass or cogon.
Coconuts, rice, sugar, fruit trees, hemp, etc Cocos, arroz, caña dulce, arboles frutales, abaca, etc	Cultivated land shall be indicated by the crops to which it is ordinarily devoted.
Mangroves, fishponds, salt works, etc... Nipa, mangles, pesquerias, salinas, etc...	Lands affected by tides shall be indicated with these words, as the case may be, and in accordance with high-tide line.
Town lot, street, plaza, etc Solar, calle, plaza, etc	Urban lands shall be indicated with these words, as the case may be.

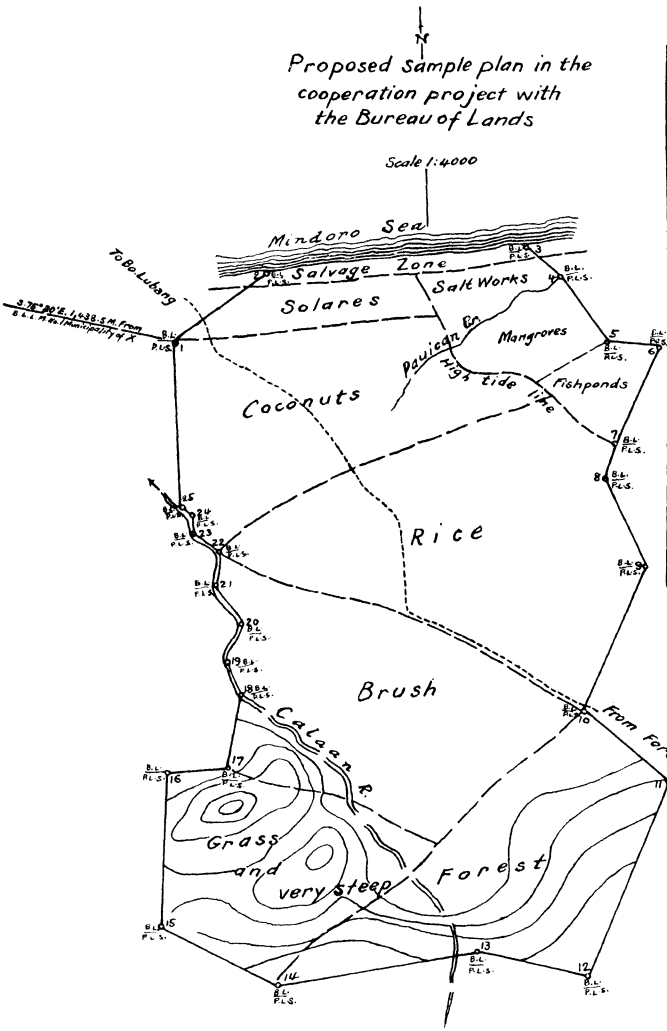
With the exception of urban maps, a blue print copy shall be forwarded to the Director of Forestry.

Cadastral surveys cover extensive areas, parts of which often include large parcels of forests, valuable not only because of their commercial importance, but also because of the necessity of conserving them as such. In view of these facts, it is advisable to inspect such areas in order to produce the necessary evidence in case of opposition. Generally, between the date of receiving the notice of hearing and the date when it is to be held, there is not time enough for carrying on the reconnaissance work and to prepare the evidence in connection with the parcels against the registration of which the Bureau of Forestry is entering opposition. For this reason, there should also be forwarded to the Director of Forestry two copies of the boundary map in each cadastral case, as soon as the plans are completed and at the time of sending the application to the General Land Registration Office or even before, if possible.

In cases where opposition by the Director of Forestry is necessary, copies of the sheets pertaining to the parcels to which opposition is to be made and the names of the claimants thereof, shall be requested in writing from the Director of Lands.

Office of the Attorney-General.—A new phase is presented in the theory on which the Hon. Justice Malcolm bases the decision of the Supreme Court No. 13298, O. G. No. 52, December 25, 1918, as regards the legal value of evidence produced at the hearing by rangers and the opposition in mere form by the Attorney-General in the name of the Director of Forestry, and which proposes as a remedy, in behalf of the Government against private claims, that the Director of Forestry should produce before the court convincing proofs that the land is more

Proposed sample plan in the cooperation project with the Bureau of Lands



Corners	Bearings	Distances
1 – 2	N 54°40'E.	109.20M.
2 – 3	N 83°05'E.	257.60 "
3 – 4	S. 52°30'E.	42.00 "
4 – 5	S. 35°30'E.	80.40 "
5 – 6	S. 87°55'E.	48.00 "
6 – 7	S 23°50'W.	110.80 "
7 – 8	S. 24°05'W.	34.00 "
8 – 9	S. 23°30'E.	103.20 "
9 – 10	S. 25°0'W.	148.00 "
10 – 11	S. 50°10'E.	112.00 "
11 – 12	S. 22°30'W.	207.20 "
12 – 13	N 75°05'W.	109.20 "
13 – 14	S. 79°30'W.	204.00 "
14 – 15	N. 61°55'W.	125.60 "
15 – 16	N. 2°30'E.	149.20 "
16 – 17	N. 84°07'E.	58.00 "
17 – 18	N. 10°20'E.	76.00 "
18 – 19	N. 30°15'W.	29.00 "
19 – 20	N. 27°20'E.	38.00 "
20 – 21	N. 38°10'W.	45.00 "
21 – 22	N. 7°25'E.	40.00 "
22 – 23	N. 56°58'W.	28.00 "
23 – 24	N. 4°05'W.	20.05 "
24 – 25	N. 48°57'W.	18.00 "
25 – 1	N. 2°07'W.	158.86 "

valuable for forest than for agricultural purposes. This makes it advisable to adopt a new procedure in regard to the manner in which forest officers should produce their evidence and also as to how the provincial fiscal should file the opposition.

Reports of forest officers shall contain, in addition to the information required in the present procedure, the amount of the timber stand, the approximate market value, a discussion of the soil and subsoil, its adaptability for cultivation, and a statement as to the purpose for which the land is better fitted according to the comparison previously made.

This report shall be made separately from the letter of transmittal to the provincial fiscal, with the heading "Technical Report on the forest inspection of Lot ..... Expediente No..... G. L. R. O. Rec. No. ....." and shall be signed by or in the name of the Director of Forestry.

Should it appear from the preliminary information that opposition is necessary and that there is not sufficient time for the preparation of evidence on the day of the trial, the officer who made the inspection shall wire the provincial fiscal requesting the suspension of the trial until the evidence is prepared. The Attorney-General, by request of the Director of Forestry, shall file the necessary opposition, submitting during the trial the technical forest report with the certification of the Director of Forestry and, if necessary, with the corroboration of the forest officer who made the inspection, and to this end the fiscal representing the Director of Forestry shall instruct and examine the witness in regard to the facts contained in the report.

On every case in which the Director of Forestry files an opposition, the Attorney-General should inform him with the least possible delay as to the decision of the court, and, in case of failure, as to whether or not an appeal should be instituted in accordance with the evidence in the proceedings.

The following table shows the status of the claims received during 1918:

Number of notices of hearings.

	Number received.	Action taken.	No action necessary after inspection.	Pending decision of court.	Number of hectares adjudicated to the Insular Government.
Cadastral	19	5	4	1	.....
Ordinary	1,216	179	104	75	319
Grand total	1,235	184	108	76	319

SECTION OF PRIVATE FOREST-LANDS REGISTRY.

Eighty-four parcels of land with a total area of 43,213 hectares, 17 ares, and 26 centares, have been applied for, for registration in accordance with the provisions of section 1829 of the Administrative Code, and examined for the information of the Collector of Internal Revenue.

Several applications for lands containing heavy timber stands and other forest products have also been received together with land tax declarations as the title of ownership, or documents showing that the land was purchased, or a sworn statement in local dialect made by a witness to justify the ownership of the claimant. Such applications have been returned to the interested parties.

Section 1513 of the Administrative Code is so ambiguous that it gives room to different interpretations. On the one hand, it refers to lands, the titles to which are not registered and, on the other, it seems to admit a mere claim of ownership. For this reason the Collector of Internal Revenue was requested to amend said section, making it clearer and shorter, so as to give the Director of Forestry the right to investigate the forest conditions of the land in connection with the claimed title to the same; and also the right of deciding the questions of fact relating to said lands, which decision, once approved by the Department Head and as long as the claimant does not present the proper title, shall be final for administrative ends. With this amendment the unfounded claims that so frequently hinder and disturb the smooth running of forest management may be eliminated and all interests, both private and governmental, be better assured.

In the course of forest administration it has been alleged in several cases when private owners were required to register their lands, that section 1829 of the Administrative Code was not applicable to them in view of the fact that their property was agricultural and not forest land, for the reason that greater or less parts of them were cultivated, even though the remaining portion contains merchantable timber, firewood, and other forest growth.

As the object of the registration provided in the above-mentioned section is to regulate the transportation of forest products and to prevent frauds that may be committed by alleging that the products were collected from private lands when they were really gathered from public lands, an amendment to the effect that the phrase *"or containing forest products"* be added

to the words *"forest land"* will make the above-mentioned section clearer and more comprehensive.

There is no provision in the present legislation authorizing the Director of Forestry to interfere with or establish regulations regarding the use of forest cover on private lands, and inasmuch as several private forest lands will necessarily be included in future projects of forest reserves and protective zones, it is very important to enact a law making the above-mentioned section 1829 more comprehensive, to the effect that a private owner of forest land included in protective forest zones, shall be economically the owner of said areas and may freely dispose of the property, but the exploitation of the same shall be regulated by the Director of Forestry, by means of a plan approved by the Head of the Department, to warrant the permanency of the forest, without any further intervention from the Bureau of Forestry, except when it is necessary to exercise inspection and supervision to insure the conservation of the forest cover.

The following table shows the private woodlands registered up to December 31, 1918:

Registered private woodlands.

Calendar year.	Number of—			
	Parcels.	Hectares.	Ares.	Centares.
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,215	86	62
1910	4	8,653	85	22
1911	5	5,533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
1917	48	7,985	68	39
1918	84	43,213	17	26
Total	990	360,802	12	59

SECTION OF PUBLIC LANDS APPLICATIONS.

The good intentions and the proposed plan of making a careful inspection of public lands applied for, in order to reduce to a minimum the number of applications pending for inspection at the end of the year, could not be carried out completely, not only because of the upset which the call to the Philippine Guard gave the field personnel, but mainly because of the trancazo epi-

demic, which prevented both inspectors and applicants from going to the land to be inspected.

In order to counteract as much as possible these difficulties, and putting aside the proposed demarcation of agricultural and forest zones, all the available field personnel were assigned during the month of December to the inspection of public lands applied for, with the object of reducing as much as possible the accumulation of this work.

Table I in Appendix C shows the distribution of applications in the different provinces of the Archipelago, the summary of which is as follows:

Applications on hand during 1918		11,722
Certified for agriculture	6,134	7,046
Certified for forestry	670	
Returned uncertified	242	
Total pending December 31, 1918		4,676

More than 40 per cent of these 4,676 pending applications have been already examined during the month of December and are only pending for the reports and recommendations of the district officers, which have not been received in Manila for certification on account of the above-mentioned causes. Further, at the direct request of applicants who were helped by forest officers in making the application, 689 parcels of public land have been examined, the certificates of which are now ready for issuance as soon as they are requested by the Director of Lands.

SECTION OF FOREST ZONES, RESERVES, AND COMMUNAL FORESTS.

On account of the same reasons set forth in the public lands application section, a great part of the work of demarcating forest zones and establishing reserves has been suspended.

Further, the proposed proclamation of certain concessions operated under contract as forest reserves could not be carried on in view of the refusal of the Governor-General to proclaim them; as, according to the opinion of the Attorney-General, "it would result in the Government exercising the right of eminent domain for the benefit of a private corporation under no obligation to serve the public, which is unconstitutional."

Now, though it is true that the chief object of requesting the proclamation of these two reserves was to protect the exploitation of the areas in question and to solve the administrative problems connected with them, yet the benefits derived from this action could be no greater for the licensee than they would be as regards the protection of a public property on which depends to some extent the economic welfare of the Islands.

If the request for the proclamation of these reserves had been made for areas not occupied under license agreement, it would not have met with any objection regarding the benefits redounding to a private enterprise, yet immediately after proclaiming a reserve, the Director of Forestry could make use of his authority to recommend the granting of a license agreement, if proper administration of the area required it.

The lumber industry is destined to become one of the first industries of the Philippines if it is given due consideration. The intensive exploitation of a forest to obtain the greatest possible return of profits can only be attained by modern methods at great expense of time and money and unless the Government is willing to carry out such exploitation on its own account, or to grant the public forests to private owners, it is absolutely necessary that greater authority be vested in the Director of Forestry for the protection of the forests of the Philippines and to assure their perpetuation in a productive condition by means of wise utilization.

It is estimated that only 25 per cent of the total area of the exploitable forests can be developed under the old methods employed by ordinary licensees. The remaining 75 per cent is inaccessible to such methods, and modern machinery is required, not only for the manufacture of timber, but also for the transportation of logs from the forest to the mill, as without such apparatus it is impossible to realize the millions of pesos represented by the timber left unused.

In the first case, licenses are usually issued for periods of from one year to two years, though in most cases they are renewed, and only such conditions as will prevent the destruction of the forest and of certain species are imposed on them. In the second case, the term is for a period of twenty years and under a contract by which the licensee is given an exclusive right to buy and collect timber and other products, imposing on him certain obligations which are specified in the contract.

With the guaranty of this contract, and in order to comply with the obligations imposed on him, the licensee has to invest great sums of money in machinery and the necessary organization to obtain profits proportioned to the productive capacity of the forest, so that to induce a private company to invest its capital on land to which it can acquire no property rights, the Government must in justice guarantee to protect the company's operations.

Meanwhile, the caingin makers, in their eagerness to find land suitable for their purposes, invade the forest areas and proceed, contrary to law, to fell and burn the stand of timber; which

infraction is penalized by twice the ordinary charge on the forest products illegally destroyed and imprisonment not to exceed thirty days, at the discretion of the court.

These illegal occupants of the land constitute a continuous and dangerous menace against the interest of the licensee as well as of the Government, for their practice destroys great areas of timber on which the licensee has based his investments and the Government suffers a double loss, on the one hand of the income derived from the sale of the timber and, on the other hand, through the expenses incurred in the trial of the culprit and his maintenance in prison.

Beside the losses mentioned, there arise continually serious conflicts between the licensee and these occupants of the land, who in the course of the exploitation of the forest hinder the licensee in hauling timber and demand of him rent or indemnity for damage to their supposed property.

In order that the Director of Forestry, as a representative of the Government, may guarantee to the party of the second part the development of future operations which are necessary for the purpose of complying with the obligations imposed on him by the contract, he should have full control over the area which was granted him for exploitation.

One of the most important tasks preliminary to the proclamation of reserves is the survey and location of monuments with the approval of the Director of Lands, but sometimes there are no surveyors available in the Bureau of Lands, though the establishment of reserves requires the intervention of technical personnel from the Bureaus of Lands and Forestry. In order that this Bureau may carry on its projects at any time, it is strongly recommended that four rangers of this division be qualified as surveyors, who will carry out all legal surveys, according to the methods approved by the Director of Lands, whether for the establishment of reserves or for the exclusion of forest areas, to the application of which the Director of Forestry has entered opposition and which were not granted to applicants by the Court of Land Registration.

These rangers will be previously detailed to the Bureau of Lands for a period of not less than six months in order to acquire experience in the handling of instruments, computation, and plotting in accordance with the methods employed in said Bureau.

The following is the result of the work carried out by this section during the year 1918:

Forest Reserves. Teak Reservation.—Two thousand five hundred and thirty-three hectares, 26 ares and 39 centares, Barrio

Suu, municipal districts of Lati, Panaman and Gitong, Province of Sulu, Jolo Island.—Proclaimed on October 31, 1918. This reservation was made to protect the largest stand of teak in the Philippines and place it under more efficient management.

Forest Station Reserve.—(One hectare) in the Mindanao Lumber Co.'s area, Barrio Naga-Naga, municipal district of Kumalaran, Province of Zamboanga, Mindanao Island.—Requested for survey to the Director of Lands on April 25, 1918.—Pending for technical description for its proclamation.

Forest Station Reserve.—(One hectare) in the Port Banga Lumber Co.'s area, municipal district of Bañgaan, Bañgaan Island, Province of Zamboanga.—Requested for survey to the Director of Lands on October 21, 1918.—Pending for technical description for its proclamation.

Forest station Reserve.—(Five and eighty-five hundredths hectares) Barrio Maribojoc, municipal district of Kolambugan, Province of Lanao, Mindanao Island.—Requested for survey to the Director of lands on March 5, 1918.—Pending for technical description for its proclamation.

Reserve for the protection of mangrove swamps.—(Ten thousand hectares) municipalities of Dumangas, Barotac Nuevo, and Banate, Province of Iloilo.—Requested for survey to the Director of Lands on July 22, 1918.—Pending the technical description for its proclamation.

Reserve for the protection of the basin of Himugaan River in order to facilitate forest management, municipalities of Sagay and Cadiz, Negros Occidental.—Proclamation disapproved on July 11, 1918.

Extension of the Forest Station Reserve of the Cadwallader-Gibson Lumber Co., with the object of facilitating forest management.—Proclamation disapproved on July 25, 1918.

Forest Zones.—The forest zones which were changed and demarcated with a view to propose their definite proclamation as forest reserves, are those of Mounts San Cristobal and Banahao in the Provinces of Tayabas and Laguna, and that of Mount Arayat in the Province of Pampanga.

Forest devastation in these regions is increasing considerably to the detriment of the surrounding agricultural regions, and in order to insure the preservation of the forest for the benefit of agriculture and to supply local demand for forest products, their immediate proclamation as reserves is required as hereinafter indicated:

Forest Zones of Mounts Banahao and San Cristobal.—Radical changes have been made in the boundaries of the forest zone on the Laguna side. The former boundaries included a vast extent of agricultural and cultivated country. Abaka, coffee, and coconut plantations of long standing, lands at present cultivated, and populated barrios were generally excluded. On the Tayabas side there were some slight changes necessary. The present proposed boundaries may have included parcels of claimed lands; but as the country above them, especially that on the Laguna side, is fit only for forestry purposes, their registration, in case such should be applied for, will be opposed regardless of vegetation found thereon.

In the course of this work, the people in the surrounding country were informed of the establishment of a reserve on the mountains. They were naturally all opposed to it, especially those who still have lands inside, but after they had been brought to see and believe the benefits to be derived from the area when established as a reserve, they seemed to feel satisfied, and some even expressed their willingness to give up the claims on their parcels.

As the boundaries and corners are made out, the country to be excluded is satisfactory to the surrounding community, for almost all their plantations, especially those made years ago, are excluded, and if any are included they are only those for the most part made recently, namely: One to four years ago, and on steep and rough country. This is especially true on the Laguna side of the proposed reserve. On the Tayabas side there are still included potential agricultural areas, but these are heavily wooded, constituting the only good forest in that region, the retention of which is of indispensable necessity for the nearby community. The approximate area of the proposed reserve is 13,400 hectares. The forest station at Lucban, Tayabas, is in charge of the protection of the present forest zone.

It is, therefore, recommended that a provisional reserve be proclaimed on the Mountains of Banahao and San Cristobal from descriptions furnished by this Bureau, awaiting the technical description of the Bureau of Lands.

Forest Zone of Mount Arayat.—It is estimated that 80 per cent of the utilization of timber, firewood, and charcoal on Mount Arayat is fraudulent. By comparing the forest charges collected by the municipal treasurers with the firewood that is being constantly gathered, this was found to be true.

MTS. BANAHAO AND SAN CRISTOBAL FOREST ZONE

(PROPOSED RESERVE)

PROVINCES OF LAGUNA & TAYABAS

Scale

KILOMETERS

1000 500 0 1 2 3 4 5 10

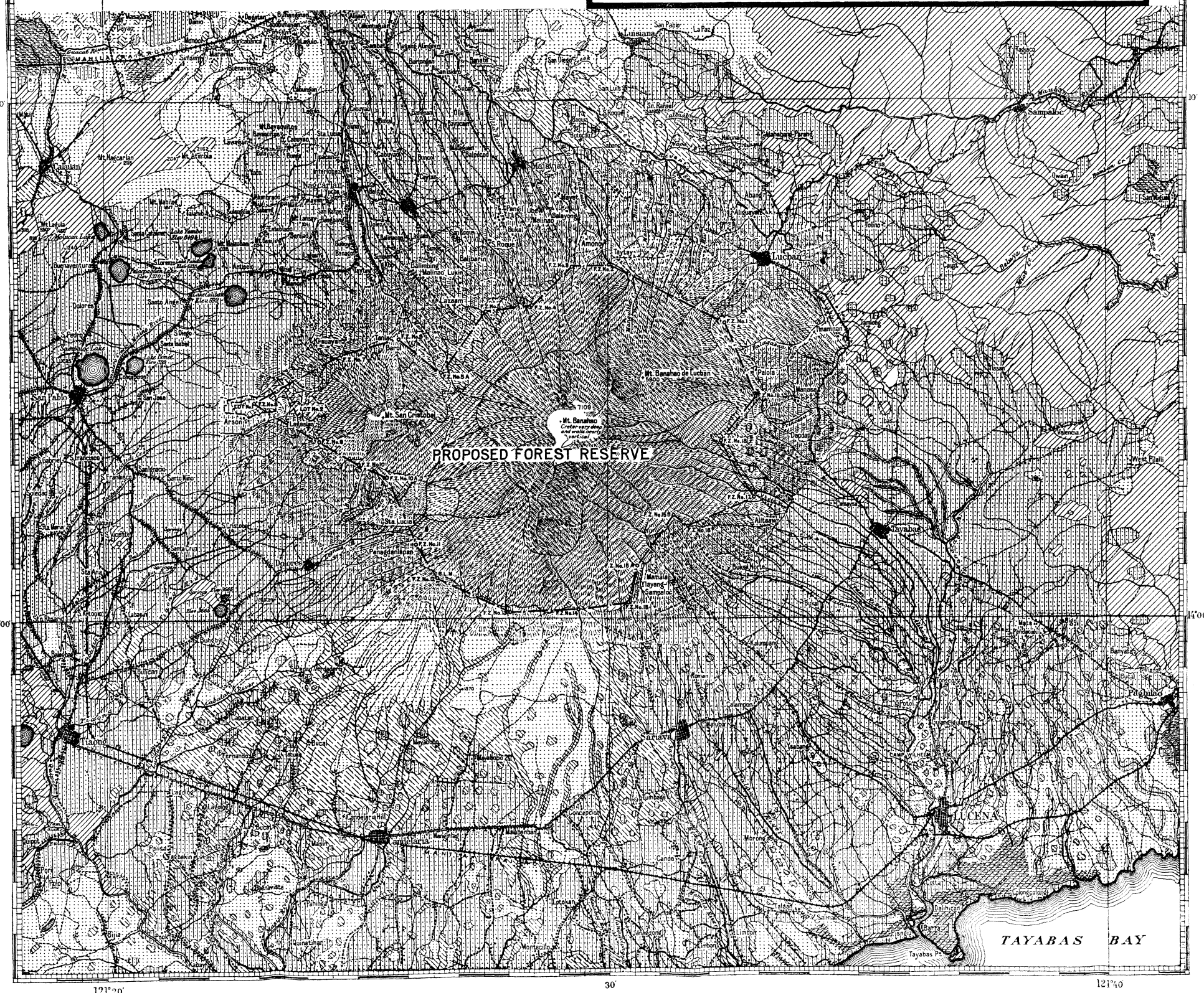
STATUTE MILES

1 3/4 1/2 0 1 2 3 4 5

LEGEND

- Commercial Forest
- Non Commercial Forest
- Cultivated Land
- Cogon and Open Land
- Swamp
- Provincial Road
- Horse Trail
- Trail
- Provincial Boundary
- Reservation Boundary




PROPOSED FOREST RESERVE
Mt. Banahao de Lucban
Mt. San Cristobal
Mt. Banahao
Crater very deep and walls nearly vertical
Mt. Negcarlan
Mt. Atimba
Mt. Macalod
Mt. Labo
Mt. Malepunyo
Mt. Cabuyao
Mt. Bayaunitan
Mt. Cabuyao
Mt. Cagua
Mt. Makiling
Mt. Calumpan
Mt. Banahao
Mt. Cristobal
Mt. Malarayat
Mt. Maquiling
Mt. Sungay
Mt. Batulao
Mt. Daiga
Mt. Gurungo
Mt. Nagpatong
Mt. Sambat
Mt. Cabalantian
Mt. Cabalantian Peak
Mt. Cabalantian Peak
Mt. Cabalantian Peak

The sugar and rice mills in the municipalities of Magalang, Arayat, and others in the vicinity are using fuel from Mount Arayat and it is estimated that more than 10,000 cubic meters of firewood are consumed in the six months during which their operations last.

There are several firewood licensees in this region, but they are mere instruments as a precaution against any prosecution or are used to prevent others from collecting firewood on the same area.

Furthermore, caiñgin makers are illegally destroying large forest areas, making a failure of the policy established by this Bureau of annually granting caiñgin permits and imposing as a duty on the caiñginero the planting of Ipil-ipil seeds, furnished by this Bureau, on the land to be abandoned and before clearing another parcel.

In order to prevent such violation and to properly regulate the use of forest products and to insure a constant supply, a patrol trail has been established surrounding the base of Mount Arayat.

The approximate area of this reserve is 4,575 hectares.

For the administration and protection of this proposed reserve, a forest station will be established in Arayat with a ranger and an assistant guard.

Communal forests.—In accordance with the provisions of the law, 63 parcels with a total area of 6,965 hectares have been located, studied, and designated as communal forests.

The following tables show the distribution of communal forests by provinces and the total of those established up to December 31, 1918:

Communal forests established from 1908 to 1918.

Years.	Parcels.	Hectares.
1908	17	5,869
1909	21	8,279
1910	19	5,762
1911	47	13,592
1912	59	10,790
1913	25	3,362
1914	45	6,790
1915	94	13,049
1916	107	15,627
1917	84	10,035
1918	63	6,965
Total	581	100,120

Settlement of communal forests established up to December 31, 1918.

	Parcels established.		Total.	Municipal townships or rancherias.	
	Before 1918.	During 1918.		With C. F.	Without C. F.
Abra	20	0	20	13	6
Albay-Catanduanes	11	1	12	9	13
Ambos Camarines	30	4	34	26	12
Antique	3	2	5	3	9
Bataan	13	0	13	12	0
Batanes	0	0	0	0	6
Batangas	0	1	1	1	23
Bohol	11	14	25	18	17
Bulacan	0	0	0	0	24
Cagayan	30	2	32	17	6
Capiz	18	3	21	17	7
Cavite	0	0	0	0	20
Cebu	8	1	9	7	42
Ilocos Norte	16	0	16	14	15
Ilocos Sur	20	0	20	17	23
Iloilo	10	0	10	5	22
Isabela	15	0	15	11	15
Laguna	11	1	12	10	17
La Union	10	0	10	10	4
Leyte	19	10	29	16	29
Mindoro	0	2	2	1	16
Misamis	14	1	15	11	42
Mindanao and Sulu:					
Agusan	1	0	1	1	56
Bukidnon	1	0	1	1	12
Cotabato	0	0	0	0	30
Davao	0	0	0	0	15
Lanao	2	0	2	2	36
Sulu	0	0	0	0	24
Zamboanga	3	0	3	2	8
Mountain Province:					
Amburayan	6	0	6	5	4
Apayao	0	0	0	0	5
Benguet	1	0	1	1	12
Bontoc	0	0	0	0	7
Ifugao	0	0	0	0	3
Kalinga	0	0	0	0	4
Lepanto	1	1	2	1	10
Occidental Negros	25	3	28	14	10
Oriental Negros	14	1	15	13	83
Nueva Ecija	16	5	21	18	35
Nueva Vizcaya	1	0	1	1	7
Palawan	0	0	0	0	14
Pampanga	3	0	3	3	18
Pangasinan	30	0	30	23	42
Rizal	4	0	4	3	22
Romblon	6	0	6	4	3
Samar	38	5	43	31	9
Sorsogon-Masbate	13	1	14	10	14
Surigao	11	2	13	7	2
Tarlac	7	2	9	7	9
Tayabas	45	1	46	23	8
Zambales	14	0	14	12	2
Total	501	63	564	405	672

Provinces.	Parcels.	Hectares.
Bulacan	1	232
Cagayan	1	325
Ilocos Norte	4	1,177
Misamis	1	400
Negros Occidental	3	520
Tayabas	1	126
Total	11	2,780
Total number of parcels and hectares established from 1908 to 1918	581	100,120
Total number of parcels and hectares cancelled in various years	11	2,780
Balance in force	570	97,340

MAPPING AND DRAFTING SECTION.

There has been prepared a new map of Luzon, Mindoro and adjacent Islands, on a scale of 1:400,000, containing all the latest valuable data secured from the Bureaus of Coast and Geodetic Surveys, Lands, Public Works, Constabulary, and other sources, to which there have been added the topographical and forest data secured by the field personnel of this Bureau. This map is for administrative use only.

The following table shows the work carried out during 1918:

Topographical and forest notes taken during 1918.

District No.	Received.	Pending.	Total.	Forest value.
	Kilometers.	*Kilometers.*	*Kilometers.*	*Hectares.*
1	147.91	852.74	1,000.65	.50
2	100.38	68.07	168.45	
3	14.21		14.21	
4	196.55	143.41	339.96	93.58
5	323.07	831.24	1,154.31	228.60
6	369.14	300.67	669.81	160.14
7	477.41	120.29	597.70	1.95
8	556.85	247.36	804.21	45.36
9	250.20	162.25	412.45	9.50
10	437.90	369.27	807.17	18.20
11	99.87	198.36	298.23	183.16
12	123.24	100.37	223.61	7.00
13	14.06	457.98	472.04	13.00
Total	3,110.79	3,852.01	6,962.80	760.99

Considerable graphical information has been added to the forest progressive sheets on the scales of 1:100,000 and 1:20,000. In addition, there have been traced different original plans for communal forests, maps of private lands for registration, model houses for forest stations, auxiliary schooners, and various other drafting work. The bars for the twelve sets of pantographs made by the Bureau have also been graduated. One thousand eight hundred and twenty (1,820) copies of blue prints were prepared for the public in general and for official purposes.

SECTION OF FOREST RECONNAISSANCES.

In view of the fact that 60 per cent of the personnel of this section specially trained in forest reconnaissance work have entered the Philippine Guard as officers, part of the projects planned during the year was necessarily suspended. The rangers of this section entering the Philippine Guard were all assigned as instructors in military mapping and sketching, which speaks well for their training and work in the Bureau. However, the reports on the reconnaissances made at the end of last year have been finished, and during this year five reconnaissances have been completed.

1. Mineral region of Paracale and Mambulao, Ambos Camarines, October, 1917.

2. Central region of Tayabas Province, October, 1917 to February, 1918.

3. Region between Lauis (north) and Salasa (south) rivers, Masinloc, Zambales, April and May, 1918.

4. Northern region of Ragay Gulf, Ragay, Ambos Camarines, April and May, 1918.

5. Coal region in Sibuguey, Zamboanga, Zamboanga, December, 1917 to June, 1918.

6. Kabibihan region (Filipinas Lumber Co.), Guinayangan, Tayabas, March and earlier part of April, 1918.

1. *Mineral Region of Paracale and Mambulao, Ambos Camarines.*—In this reconnaissance, the attempt was made to locate every mineral claim in the jurisdiction of Paracale and Mambulao, for the purpose of studying the necessities of each one with respect to wood consumption and to better the handling of forest products found therein, but due to the defective methods of the original laying-out of the claims, not all that was desired could be accomplished. The majority of them, however, were located. There were 40 placer claims and 302 lode claims and Spanish concessions, scattered over an approximate area of 17,990 hectares. Among the companies in active operations on the gold claims are the following:

Malaguit Dredging Company.
Paracale Bucket Dredging, Ltd.
Philippine Dredgers, Ltd.
Malagno Placer Co.
Gumaos Placer Co.
Le Duc Mine.
Mambulao Placer Co.

Aside from the above, there were also several other prospected claims which, according to indications, will start operations within a short time. In and about Mambulao iron deposits were also located and immediate development is said to be under serious consideration by the locators.

Almost all of the above-mentioned companies are operating placer claims and a careful study of the conditions with regard to meeting the wood consumption of the dredges was the main object of the reconnaissance. The question of supplying adequate amounts of timber for building and firewood purposes has been the serious problem of some of the miners who were not fortunate enough to have an abundant supply of timber on their claims for development. These miners have to resort to

the supply of firewood for fuel. The small amount of coal available during the year ran to such prices that it was almost prohibitive to use coal and for this reason the miners had to depend entirely upon the supply of firewood to keep the dredges running. For this purpose, licenses were issued to allow them to operate on unoccupied areas. The data gathered enable this Office to decide questions raised by the needy miners and to regulate the operations of the licensees.

2. *Central Region of Tayabas.*—Due to the opening up of the southern extension of the Manila Railroad Company, followed by rapid agricultural and commercial development, the necessity for a more thorough knowledge of the country was indispensable. To meet the numerous inquiries of the public with regard to possible cutting operations and vacant agricultural land, the Bureau of Forestry made a reconnaissance of the central region of Tayabas Province, comprising the municipalities of Unisan, Pitogo, Macalelon, and Mulanay, on the southern coast, and Gumaca, Lopez, Calauag, and part of Guinayangan, on the Pacific coast. This reconnaissance was made mainly to secure information regarding topography and forest condition of this region for better administration and for the proposed establishment of forest and agricultural zones. The report covering this area is divided into two main headings; that is, the study of the highland forest and of the mangrove swamps.

Extension of Area of the Highland Forest.—The area considered as highland forest in this region is approximately 36,090 hectares in extent, located in four separate blocks. These four blocks of forest are further divided into ten compartments, each compartment having its corresponding field data which are sufficient to appraise the importance and value of any of the particular sections.

Extension and Area of Mangrove Swamps.—The lowland or mangrove swamps discussed comprise an area of 8,090 hectares and have likewise been studied. The information acquired regarding their forest value is of material help to this Office. These swamps are also located in four separate blocks, and are divided into fifteen compartments.

3. *Region Between Lauis (north) and Salasa (south) Rivers, Masinloc, Zambales.*—A detailed study of the region between Lauis (north) and Salasa (south) rivers of Masinloc, Zambales, was made during the year 1918. The study was mainly to secure as much information as possible regarding the topography and stand of timber for more extensive management and forest utilization. The proximity of this region to the timber markets,

coupled with a good stand of timber, attracted the attention of lumbermen for the information of whom the report was made. The report submitted covering this region was grouped into two parts; the first deals with the general description of the area, while the second deals with the logging, manufacturing and shipping facilities. A company that is holding an ordinary timber license in this region is contemplating taking up a long term concession for the proper development of the timber industry in this region. The area covered by this sutdy is approximately 16 kilometers from east to west and 7 to 14 kilometers from north to south.

4. *Northern Region of Ragay Gulf, Ragay, Ambos Camarines.*—The territory covered by the reconnaissance made in the northern region of Ragay Gulf is located between Ragay and the Tagcauayan-Labo trail in the Municipality of Ragay, Ambos Camarines. It comprises an area of approximately 70,800 hectares divided as follows:

Commercial forest	hectares	62,360
Cogon	do	4,460
Brush	do	2,060
Cultivated	do	1,920
Total	do	70,800

The main object of the reconnaissance was to secure as much information as possible regarding the condition of the country for better management. In this region there are small sawmills operating under ordinary timber licenses, and in order to manage their operations intelligently, more comprehensive data of the actual conditions were essential.

5. *Coal Region in Sibuguey, Zamboanga.*—A forest reconnaissance was made on the Sibuguey Peninsula for the purpose of studying the timber stand for better management in connection with the operations of the National Coal Company. The territory covered by this study is bounded on the north, by the parallel of latitude 7° 42′; east, by Dumanquilas Bay; south, by Locsico and Tantanang Bays, Canalizo Strait, north of Olutanga Island; and on the west, by Sibuguey Bay. The extent of the area from north to south is approximately 22 kilometers and from east to west 26 kilometers. The coast-lines extend approximately 65 kilometers, mostly on the western and southern sides.

The area is estimated to be 45,600 hectares or 456 square kilometers. An approximate area of 16,200 hectares or 16.2 square kilometers is covered with commercial forest; 25,200

hectares or 25.2 square kilometers, with non-commercial forest in which brush land, grass land, marshes, and small cultivated portions are included; 4,200 hectares or 4.2 square kilometers, with mangrove and nipa swamps, occupying an area along the western coast. The greater part of this peninsula is uninhabited and not often visited by natives.

The hills of Sibuguey and Bailan rise abruptly from the western coast and form several broken chains of hills ranging from 700 to 1,000 feet in elevation, and descending to the Lutima Valley. These hills from the principal central divide between the north and the south parts of the peninsula. With the exception of the few precipitous slopes in the Sibuguey and Kaladis Mountains, the hills rise gradually, few of them attaining an altitude of over 1,000 feet.

6. *Kabibihan Region, Guinayangan, Tayabas.*—In connection with the summer camping trip of the students of the Forest School at Los Baños, Laguna, a reconnaissance party from the main office was assigned with the end in view of locating the agricultural and forest lands, to secure as much information as possible for a better exploitation of the forest and at the same time to prepare the basis for the establishment of forest zones and reserves. The timber stand covered by the reconnaissance contains approximately 2,000,000 cubic meters, which is enough to furnish the mill (Filipinas Lumber Co.) operating in the locality for a period of forty years. The timber consists largely of Yakal, Apitong, Guijo, and similar species, all of which are at present in demand in the markets.

The area consists of a comparatively narrow strip along the coast which is level, a much larger area back of this which is rolling and an area in the upper part of the concession which is rough. All of the area is capable of being logged by steam, except some of the flat land along the coast, which is culled over and where the timber is too scattered to warrant the use of steam logging machinery.

Taken as a whole, the area studied, that is, the region within the concession of the Filipinas Lumber Company, presents a very favorable opportunity for steam logging, and with the opening of the railroad through this region offers better prospects for the company.

ADMINISTRATIVE DIVISION.

The work of this division, having charge of all the clerks, was somewhat handicapped during the year because of the fact that many clerks have passed Civil Service examinations for higher rating, while the Bureau had no funds appropriated

to pay the salaries called for under their new Civil Service grade. As a result, several clerks resigned or sought transfers to other bureaus of the Government having positions vacant in the new grades. This resulted in the Bureau being exceedingly short-handed as far as clerks were concerned. Another factor from which the Bureau suffered was the inability to obtain eligibles from the Bureau of Civil Service for positions vacated by clerks having obtained higher Civil Service rating. At the present time these positions are vacant and the work is being carried on by the remaining clerks, which, at best, is not satisfactory. Furthermore, the increase in the number of clerks has not been in proportion to the work necessitated by the increase in field personnel and the resulting activities. To keep the work up as in the past, it will be necessary to increase the number of clerks and to allow certain elasticity in the appropriation to take care of clerks who have obtained higher Civil Service ratings.

GENERAL SERVICE SECTION.

The system of handling correspondence, which was instituted and studied last year, has been found very efficient, relieving to some extent the pressure of work on certain clerks and not interfering with the routing of correspondence and work of the several division chiefs. It allowed the saving of time for messengers who were put on quasi-clerical work to help out the situation.

RECORDS SECTION.

It has become increasingly difficult to hold an efficient record clerk because of the salary allowed. The chief of this section, who took over the position upon the resignation of the former chief in 1917, resigned because of better opportunities in private work. A new chief was appointed from another Bureau. Because of the frequent change of personnel in this section, since the present filing scheme requires intimate acquaintance with the subject matter of the correspondence, which is identified in this Bureau by the subject dealt with, under special designation, it is found necessary to introduce a system whereby the filing and recording of correspondence will be made less dependent upon the changing personnel, and it is planned to institute a decimal system for trial this coming year.

ACCOUNTING SECTION.

The accounting system as inaugurated by the Bureau of Audits in the past year has been followed, which has simplified the work to some extent. The personnel of this section has been

augmented in view of the fact that the necessary journals, ledgers, and other records of account which were formerly taken care of by the Bureau of Audits have been placed in the Bureaus charged. It is believed that with the increase in personnel of this section, the requests for the prompt payment of traveling expenses, etc., will be satisfied, with as little delay as possible.

PROPERTY SECTION.

During the past year, at times, certain stocks carried in the Bureau ran very low, due principally to the impossibility of obtaining material and equipment from the United States. The entire personnel of the Bureau was again cautioned as to the necessity for the greatest economy in the use of expendable and nonexpendable property. As stated before, practically all the equipment, such as tables, record files, etc., were made in the Bureau's workshop.

STATISTICS SECTION.

The work on statistics of forest products has been carried on fairly well despite the handicap of a lack of sufficient personnel, and it is hoped that as soon as this section is fully staffed, a system of devising methods for securing more accurate and complete data will be put into practice.

LIBRARY AND TRANSLATING SECTION.

New books, catalogs, trade journals, and scientific papers were properly filed and listed upon receipt. All items of interest to the Bureau were clipped from the newspapers of the Islands. All journals and scientific papers of permanent value were bound, and the lumber journals of 1917 were sent out to the field force. The matter of supplying the field force with readable literature is being studied, as many of the outlying stations have not the advantage of using books from the school libraries. Several sets of journals and novels were furnished the Forest School, through this section, from the Philippine Library.

PROPOSED CHANGES.

Due to the increase in personnel in the field force of the Bureau, it is thought necessary that another division, which will have under its jurisdiction the finances and accounts of the Bureau, be created at the beginning of next year. This division will relieve the Chief Clerk to a great extent and will allow him time to concentrate his activities on the execution of the administrative work of the Bureau. The new chief of this

division will be authorized to sign for the Director on routine matters concerning finances, accounts and property, which will, to a great extent, relieve the Director of this work.

CLASSIFICATION OF WORK.

As will be noticed in this year's report, a more detailed classification has been instituted in figuring the cost of the various classes of major work in the Bureau. The per cent of cost has been decreased to quite an extent in certain lines and increased considerably in others. For instance, the reconnaissance has been increased over last year. It then included the forest zone work, which under this year's classification is separated, showing an increase in what is essentially forest work. Forest zones were separated this year, inasmuch as the cost data on the future forest reserves will be compiled in such a manner that the Bureau will be in a position to give the exact cost of all work on each individual reserve when proclaimed. Land cases and private woodlands have been separated from the general classification "public lands" so as to get a more detailed idea of the time and money spent on this special work, which is becoming increasingly important. The classification "concessions" has been separated from the classification "licenses" for the same reason, and it is hoped that in the future, as work of a distinct nature becomes of sufficient importance, that data as to cost and time spent will be compiled.

Table showing number of days and cost of each class of work performed by the field force of the Divisions of Forest Management and Forest Lands and Maps during the fiscal year, 1918.

District.	Licenses.				Caiñgins.				Public lands.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
No. 1	1,571	37.64	3,731.12	31.66	30	.77	64.09	.55	827	20.48	2,395.37	20.70
No. 2	406	32.25	1,454.73	30.20	33	2.68	101.71	2.06	386	30.64	1,580.26	32.71
No. 3	1,772	58.52	2,489.73	37.65	99	3.36	121.50	1.84	30	.99	106.00	1.60
No. 4	575	27.40	1,726.48	24.85	13	.62	50.61	.74	792	37.70	2,743.46	39.84
No. 5	1,889	29.40	4,447.01	21.88	348	5.40	741.52	3.67	1,307	20.30	3,803.08	18.81
No. 6	1,523	33.40	3,486.57	26.33	697	15.27	1,685.08	12.18	725	15.88	2,440.94	18.23
No. 7	2,201	29.79	5,197.28	29.56	789	10.61	1,468.72	8.39	892	12.01	2,588.52	14.78
No. 8	1,926	23.54	5,144.23	16.59	261	3.17	611.30	1.99	1,216	14.85	6,193.01	19.99
No. 9	436	75.39	1,373.97	34.47	130	10.70	507.35	12.74	322	26.00	1,069.31	26.83
No. 10	1,162	37.36	3,318.84	35.00	308	9.75	1,030.53	10.85	634	20.53	2,194.51	23.10
No. 11	2,227	37.80	4,536.24	31.40	167	2.82	404.89	2.79	379	6.43	1,113.32	7.78
No. 12	293	23.55	981.24	23.02	66	5.39	132.14	3.10	420	33.62	1,526.07	35.18
No. 13	585	25.00	1,664.52	17.75	217	9.30	600.43	6.44	351	14.94	1,113.57	11.92
Total	16,566	32.80	39,551.69	25.71	3,158	6.20	7,519.87	4.90	8,281	16.40	28,867.42	18.80

Table showing number of days and cost of each class of work performed by the field force of the Divisions of Forest Management and Forest Lands and Maps during the fiscal year, 1918—Continued.

District.	Communal forest.				Forest zones.				Reconnaissance.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per-cent.	Number.	Per-cent.	Number.	Per-cent.	Number.	Per-cent.	Number.	Per-cent.	Number.	Per-cent.
No. 1	67	1.70	236.56	2.03					498	12.60	1,314.63	11.27
No. 2	49	3.90	149.80	3.07								
No. 3	1	.03	12.51	.19					11	.36	130.64	1.98
No. 4	73	3.48	223.50	3.23	13	.62	56.21	.82	102	4.86	402.84	5.85
No. 5	39	.66	119.47	.60	108	1.67	336.07	1.54	289	4.49	1,153.62	5.71
No. 6	72	1.68	243.12	1.82	5	.11	13.34	.01	234	5.12	1,255.58	9.50
No. 7	68	.91	219.36	1.28					54	.72	238.90	1.39
No. 8	52	.63	184.14	.59					518	6.34	3,389.79	10.98
No. 9												
No. 10	129	4.17	419.22	4.40	4	.13	12.75	.13	4	.13	8.75	.09
No. 11	83	1.41	209.70	1.45	91	4.54	441.43	3.03	168	2.85	582.32	4.08
No. 12	17	1.38	62.54	1.47	19	1.55	59.32	1.38				
No. 13	127	5.43	379.41	4.07					134	5.74	577.80	6.19
Total	777	1.50	2,459.33	1.60	240	.45	919.12	.60	2,012	3.90	9,054.87	5.88

District.	Land cases.				Private woodlands.				Concession.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
No. 1	17	.44	40.99	.35								
No. 2	11	.90	75.80	1.57	2	.16	5.33	.11				
No. 3									88	2.92	85.48	1.29
No. 4	99	4.72	366.32	5.39	8	.39	30.64	.45	11	.59	53.78	.78
No. 5	123	1.91	599.45	2.97	63	.98	225.44	1.15	217	3.38	550.79	2.76
No. 6	39	.85	163.28	1.23	30	.65	104.75	.79	20	.43	55.51	.05
No. 7	125	1.66	517.45	2.94	82	1.10	163.09	.93	2,407	32.50	3,662.55	20.47
No. 8	39	.47	171.82	.56	3	.03	11.51	.04	2,609	31.98	10,362.14	33.42
No. 9	19	1.54	50.62	1.27	1	.08	4.16	.12				
No. 10	8	.26	64.11	.67								
No. 11	99	1.67	433.15	2.98	42	.71	127.74	.88	961	16.35	1,785.48	12.39
No. 12	6	.49	42.02	.97	3	.24	9.42	.24				
No. 13	60	2.56	265.80	2.83	5	.21	48.82	.52	3	.12	64.55	.69
Total	645	1.22	2,790.81	1.81	239	.45	730.90	.48	6,316	12.40	16,620.28	10.81

District.	Nurseries.				Patrol trail and trail building.				Botanical collections.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
No. 1	49	1.28	187.28	1.60					11	.29	22.31	.19
No. 2	132	10.44	554.06	11.46					4	.32	17.84	.37
No. 3	65	2.15	314.93	4.76	44	1.52	31.50	.48	17	.56	11.64	.18
No. 4	2	.09	5.83	.08					8	.39	23.47	.35
No. 5	4	.06	854.00	4.22	409	6.35	999.79	4.93	34	.52	99.54	.51
No. 6	1	.02	2.10	1.59					42	.92	90.66	.07
No. 7	41	.55	151.50	.87					8	.01	19.24	.02
No. 8	5	.06	18.92	.06	186	2.27	201.37	.65	48	.58	120.15	.42
No. 9	8	.65	43.48	1.09					26	2.14	108.49	2.73
No. 10	4	.13	11.17	.11					13	.42	37.61	.39
No. 11	32	.55	83.30	.57	219	3.72	907.72	6.30	79	1.38	188.92	1.30
No. 12									2	.16	11.38	.27
No. 13	275	1.72	2,319.81	24.63	162	6.93	551.82	5.89	7	.28	15.56	.19
Total	618	1.20	4,546.38	2.95	1,020	2.01	2,692.20	1.75	299	.54	775.81	.55

Table showing number of days and cost of each class of work performed by the field force of the Divisions of Forest Management and Forest Lands and Maps during the fiscal year, 1918—Continued.

District.	Sundays and holidays.				Travel.				Leave.			
	Days.		Cost.		Days.		Cost.		Days.		Cost.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
No. 1	424	10.68	1,642.30	14.09	105	2.66	653.31	5.60	77	1.95	181.19	1.56
No. 2	150	11.92	456.07	9.45	15	1.15	144.84	2.98	43	3.42	157.39	3.26
No. 3	411	13.60	846.70	12.81	14	.47	104.79	1.58	58	1.92	153.85	2.27
No. 4	247	11.60	608.00	8.85	22	1.05	174.87	2.59	75	.57	196.63	2.85
No. 5	809	12.52	2,133.18	10.51	83	1.29	525.40	2.60	296	4.60	726.99	3.60
No. 6	584	12.80	1,272.27	9.65	108	2.36	863.54	6.52	168	3.68	421.39	3.18
No. 7	238	3.21	1,535.75	8.80	50	.67	387.04	2.20	98	1.34	237.07	1.38
No. 8	929	11.35	3,331.87	10.75	99	1.21	606.07	1.96	112	1.37	328.23	1.05
No. 9	147	11.65	356.18	8.95	29	2.35	177.88	4.45	43	3.39	99.71	2.52
No. 10	437	14.60	1,091.95	11.47	50	1.67	394.66	4.14	172	5.56	429.91	4.44
No. 11	591	10.40	1,245.00	8.55	103	1.75	649.85	4.51	434	7.35	935.40	6.49
No. 12	192	15.66	571.45	13.40	55	4.48	331.17	7.76	39	2.85	109.62	2.55
No. 13	248	10.60	641.04	6.86	23	.98	330.92	3.62	90	3.84	216.17	2.33
Total	5,407	10.60	15,731.76	10.21	756	1.43	5,344.34	3.47	1,705	3.50	4,193.55	2.72

District.	Miscellaneous.				Total.			
	Days.		Cost.		Days.		Cost.	
	Number.	Per-cent.	Number.	Per-cent.	Number.	Per-cent.	Number.	Per-cent.
No. 1	372	9.51	1,208.35	10.39	4,048	7.95	11,677.50	7.58
No. 2	28	2.22	132.78	2.76	1,259	2.70	4,830.61	3.39
No. 3	412	13.59	2,204.53	33.37	3,022	5.90	6,613.80	4.30
No. 4	62	2.93	224.71	3.33	2,102	4.13	6,887.35	4.47
No. 5	416	6.46	2,991.93	14.54	6,434	12.62	20,307.28	13.20
No. 6	317	6.93	1,171.25	8.85	4,565	8.98	13,269.38	8.63
No. 7	365	4.92	1,229.34	6.99	7,418	14.59	17,615.81	11.48
No. 8	174	2.15	289.64	.95	8,177	16.03	30,973.19	20.01
No. 9	73	5.91	193.41	4.83	1,234	2.42	3,984.56	2.58
No. 10	173	5.59	495.05	5.21	3,098	6.05	9,509.06	6.24
No. 11	214	3.63	808.64	5.50	5,889	11.58	14,453.10	9.39
No. 12	136	10.63	425.16	10.05	1,248	2.45	4,261.53	2.65
No. 13	54	2.32	568.38	6.07	2,341	4.60	9,358.60	6.08
Total	2,796	5.40	11,943.17	7.76	50,835	100	153,741.77	100

COÖPERATION.

The policy of coöperating with other government agencies and private enterprises to the fullest extent and with every means available has been continued. This has been touched upon under other headings in this report.

INCOME.

The income of the Bureau, as will be noticed from the table in the appendix during the past year, amounts, from the latest figures available, to ₱650,691.61, while the appropriation of the Bureau last year, including the deficiency, amounted to ₱352,100, of which ₱332,334.72 were spent, giving a percentage of expenditures to revenues of 51.

RECOMMENDATIONS.

The undersigned wishes to again repeat the recommendations made in last year's annual report.

The illegal occupation of public land to be punished by law.

The penalties for the destruction of forests to be increased.

The penalties for evading the payment of forest charges should be materially increased for the second offense.

The illegal cutting of forest products should be classed as theft and treated as such.

Section 1520 of the Administrative Code should be changed to require the payment of forest charges on all forest products cut or gathered, whether removed from the forest or not, before a license expires.

Efficient means for the eradication of water hyacinth should be instituted.

Forest guards should be forbidden to have any pecuniary interest in forest products.

The Bureau of Forestry should be given positions for qualified surveyors to do the urgent survey work on forest reserves. Coöperation with the Bureau of Lands as recommended under the Division of Forest Lands and Maps should be instituted. An attorney of the Bureau of Justice should be assigned wholly to the legal work of this Bureau. Provincial fiscals to take more interest in forestry cases, especially in the presentation of evidence.

It is recommended that the present system of the disposal of public lands be changed, inasmuch as at present lands are selected by individuals, settled and cultivated to some extent, before surveys have been made, and it is next to impossible to guard the interests of the Government along conservation lines as long as this system is followed. Conflicts are constantly

being engendered between neighboring settlers as well as with the Government. No provision is made for possible rights-of-way by the Government for roads, etc., in new areas and it is a well-known fact, brought out by several investigations throughout the world, that the individual in general is not competent to select land for his own best interest or that of the Government. It is recommended that the Government institute as soon as possible a system of surveying land before settlement, as is now being done in some of the agricultural colonies.

Provision should be made for a permanent forest guard force. An increase in the clerical personnel, not only in number but also in salaries, is essential. Provision should be made for a systematic reforestation and reconnaissance on a large scale.

For the Forest School and the Division of Investigation additional buildings are necessary as well as additional equipment to adequately give the higher course and carry on ivestigative work. Additional cottages are necessary for the housing of the students and personnel of the School and the Division of Investigation.

Personnel.—As stated last year, the demand for forest officers of the Bureau of Forestry in the Orient has again been felt, and is strongly recommended, that the salaries be placed on the same basis as all other scientific branches of the Government; that the amount of per diems now received by the rangers be increased, necessitating a change in the Administrative Code; that field clothing, especially shoes, blankets, mosquito nets and khaki, be bought by the Bureau and sold to the men in the field at cost.

It is further recommended, that game and fish legislation to be made stricter and entrusted to forest officers for administration.

Arthur F. Fischer

Director of Forestry.

The SECRETARY OF
AGRICULTURE AND NATURAL RESOURCES,
Manila.

APPENDIX.

STATISTICAL TABLES.

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value.*

Provinces.	Received from the Bureau of Lands.									Certification made to the Bureau of Lands.								
	Pending from previous year.				During the year 1918.				Total.	Agriculture.				Forestry.				
	A.C.	H.	P.	L.	A.C.	H.	P.	L.		A.C.	H.	P.	L.	A.C.	H.	P.	L.	Total.
Abra	0	8	1	0	0	21	1	0	31	0	23	0	0	0	0	0	0	23
Agusan	0	99	4	0	0	164	19	8	294	0	162	9	3	0	0	5	2	181
Albay	0	18	6	0	0	169	9	0	202	0	113	7	0	0	10	0	0	130
Ambos Camarines	0	304	4	0	0	359	13	3	683	0	307	1	0	0	100	2	1	411
Antique	0	13	0	0	0	28	0	0	41	0	22	0	0	0	0	0	0	22
Bataan	0	42	6	1	0	159	20	3	231	0	103	14	1	0	2	0	1	121
Batanes	0	0	0	0	0	5	1	0	6	0	5	1	0	0	0	0	0	6
Batangas	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Bohol	0	12	1	0	0	40	1	4	58	0	37	1	3	0	0	0	0	41
Bukidnon	0	0	0	0	0	12	1	1	14	0	5	0	0	0	0	0	0	5
Bulacan	0	24	2	0	0	7	0	0	33	0	20	2	0	0	5	0	0	27
Cagayan	0	84	7	0	0	253	13	1	358	0	235	13	0	0	1	0	0	249
Capiz	0	25	3	1	0	27	2	0	58	0	8	2	0	0	9	0	0	19
Cavite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cebu	0	6	2	0	0	17	8	0	33	0	11	7	0	0	1	0	0	19
Cotabato	0	63	10	6	41	394	2	9	525	41	214	10	3	0	0	0	0	268
Davao	0	198	15	22	0	370	44	103	752	0	284	25	35	0	9	0	1	354
Ilocos Norte	0	10	2	0	0	15	1	1	29	0	9	2	0	0	3	0	1	15
Ilocos Sur	0	69	12	0	0	147	13	1	242	0	136	18	0	0	10	0	0	164
Iloilo	0	3	1	0	0	18	4	0	26	0	6	3	0	0	0	0	0	9
Isabela	0	94	0	1	0	135	8	2	240	0	181	7	3	0	2	0	0	193
Laguna	0	7	0	0	0	44	3	0	54	0	14	0	0	0	9	3	0	26
Lanao	0	23	1	0	0	71	1	1	97	0	63	1	0	0	1	0	0	65
La Union	0	64	7	1	0	53	7	3	135	0	90	9	1	0	7	1	1	109
Leyte	0	141	6	0	0	212	12	3	374	0	171	9	1	0	14	0	0	195
Mindoro	0	250	14	0	0	409	35	9	717	0	335	28	6	0	53	1	0	423
Misamis	0	9	1	0	0	41	1	0	52	0	42	1	0	0	4	1	0	48
Mountain	0	48	6	1	0	24	1	1	81	0	33	2	1	0	8	2	1	47
Negros Occidental	0	120	1	0	0	325	10	5	461	0	262	6	0	0	48	1	1	318
Negros Oriental	0	6	1	0	0	8	1	0	16	0	0	0	0	0	2	0	0	2
Nueva Ecija	0	621	40	5	0	1,432	97	50	2,245	0	1,232	81	31	0	127	9	3	1,483
Nueva Vizcaya	0	74	17	0	0	173	6	2	272	0	133	17	0	0	0	0	0	150
Palawan	0	102	1	1	0	112	2	3	221	0	89	2	3	0	9	0	0	103

Pampanga	0	12	0	0	0	36	4	1	53	0	22	2	1	0	9	0	0	34
Pangasinan	0	253	19	1	0	248	56	6	583	0	300	53	4	0	21	2	2	382
Rizal	0	8	1	0	0	40	5	1	55	0	31	4	1	0	3	0	0	39
Romblon	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0
Samar	0	9	0	0	0	32	2	0	43	0	30	0	0	0	1	0	0	31
Sorsogon	0	44	9	0	0	162	10	2	227	0	110	6	1	0	10	1	0	128
Sulu	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	1
Surigao	0	2	0	0	0	29	4	1	36	0	20	3	1	0	2	0	0	26
Tarlac	0	35	7	1	0	214	21	5	283	0	32	6	4	0	2	0	0	44
Tayabas	0	367	30	0	0	727	47	1	1,172	0	313	23	0	0	115	3	0	454
Zambales	0	143	21	11	0	41	9	9	234	0	105	19	5	0	5	2	1	137
Zamboanga	0	75	7	1	0	370	31	6	490	0	296	26	1	0	19	0	1	343
Total	0	3,485	265	53	41	7,148	526	245	11,763	41	5,605	420	109	0	621	33	16	6,845

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value*—Continued.

Provinces.	Returned to the Bureau of Lands uncertified during the year 1918.				Total pending inspection December 31, 1918.				
	H.	P.	L.	Total.	A. C.	H.	P.	L.	Total.
Abra	0	0	0	0	0	6	2	0	8
Agusan	7	0	0	7	0	94	9	3	106
Albay	0	1	0	1	0	64	7	0	71
Ambos Camarines	3	0	0	3	0	253	14	2	269
Antique	0	0	0	0	0	19	0	0	19
Bataan	3	1	2	6	0	93	11	0	104
Batanes	0	0	0	0	0	0	0	0	0
Batangas	0	0	0	0	0	0	1	0	1
Bohol	2	0	0	2	0	13	1	1	15
Bukidnon	0	0	0	0	0	7	1	1	9
Bulacan	3	0	0	3	0	3	0	0	3
Cagayan	15	1	0	16	0	86	6	1	93
Capiz	2	1	0	3	0	33	2	1	36
Cavite	0	0	0	0	0	0	0	0	0
Cebu	0	0	0	0	0	11	3	0	14
Cotabato	0	0	2	2	0	243	2	10	255
Davao	7	0	7	14	0	268	34	82	384
Ilocos Norte	2	1	0	3	0	11	0	0	11
Ilocos Sur	9	0	0	9	0	61	7	1	69
Iloilo	0	0	0	0	0	15	2	0	17
Isabela	3	0	0	3	0	43	1	0	44
Laguna	1	0	0	1	0	27	0	0	27
Lanao	1	0	0	1	0	29	1	1	31
La Union	1	0	0	1	0	19	4	2	25
Leyte	24	1	1	26	0	144	8	1	153
Mindoro	6	1	0	7	0	265	19	3	287
Misamis	1	0	0	1	0	3	0	0	3
Mountain	4	0	0	4	0	27	3	0	30
Negros Occidental	18	0	1	19	0	117	4	3	124
Negros Oriental	0	0	0	0	0	12	2	0	14
Nueva Ecija	71	1	1	73	0	623	46	20	689
Nueva Vizcaya	3	0	0	3	0	111	6	2	119
Palawan	3	0	0	3	0	113	1	1	115
Pampanga	3	0	0	3	0	14	2	0	16
Pangasinan	4	1	0	5	0	176	19	1	196
Rizal	0	0	0	0	0	14	2	0	16
Romblon	0	0	0	0	0	4	0	0	4

Samar	0	0	0	0	0	10	2	0	12
Sorsogon	1	0	1	2	0	85	12	0	97
Sulu	0	0	0	0	0	0	0	0	0
Surigao	0	0	0	0	0	9	1	0	10
Tarlac	0	1	0	1	0	215	21	2	238
Tayabas	13	1	0	14	0	653	50	1	704
Zambales	0	0	0	0	0	74	9	14	97
Zamboanga	5	0	1	6	0	125	12	4	141
Total	215	11	16	242	0	4,192	327	157	4,676

Fiscal year—	Agricultural colonies.			Homesteads.			Sale applications.			Leases.			Grand total.
	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	
1905	0	0	0	80	6	86	8	0	8	0	0	0	94
1906	0	0	0	318	16	344	20	1	21	1	0	1	356
1907	0	0	0	881	19	900	23	0	23	12	0	12	935
1908	0	0	0	2,456	51	2,507	49	1	50	26	0	26	2,583
1909	0	0	0	1,523	187	1,710	26	3	29	27	0	27	1,766
1910	0	0	0	1,175	385	1,560	34	5	39	42	2	44	1,643
1911	0	0	0	1,528	221	1,749	46	3	49	30	1	31	1,829
1912	0	0	0	2,609	301	2,910	95	11	106	47	1	48	3,064
1913	0	0	0	2,680	269	2,949	104	30	134	47	1	48	3,131
1913 (July 1 to December 31)	0	0	0	1,653	159	1,812	81	16	97	41	3	44	1,953
1914	0	0	0	4,812	685	5,497	279	36	315	77	1	78	5,890
1915	1,086	28	1,114	5,965	688	6,653	317	52	369	70	1	71	8,207
1916	934	41	975	6,015	670	6,685	227	18	245	55	4	59	7,964
1917	670	0	670	7,632	797	8,429	457	27	484	118	6	124	9,707
1918	41	0	41	5,605	621	6,226	420	33	453	109	16	125	6,845
Total	2,731	69	2,800	44,932	5,075	50,007	2,186	236	2,422	702	36	738	55,967

SUMMARY.

Applications on hand during 1918		11,763
Certified for Agriculture	6,175	
Certified for Forestry	670	
Returned uncertified	242	
		7,087
Total pending December 31, 1918		4,676

Furthermore, at the request of the applicants 689 parcels of public land have been inspected, the certificate of which is now pending the request by the Bureau of Lands.

NOTE.—A. C. = Agricultural Colony of 16 hectares lot; H. = Homestead; P. = Purchase; L. = Lease.

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species, cut and invoiced in the Philippine Islands during fiscal year 1910 to 1918.*

Species.	Fiscal year—				July 1 to Dec. 31, 1913.	Fiscal year.					Total, 1910 to 1918.
	1910	1911	1912	1913		1914	1915	1916	1917	1918	
Lauan	43,439	46,942	57,036	81,469	20,249	74,453	73,277	107,634	131,699	108,900	745,098
Apitong	20,764	21,096	28,929	32,391	12,905	32,328	38,849	56,529	55,335	56,274	351,400
Tangile	2,106	2,762	3,999	5,249	3,390	14,682	15,460	28,961	25,389	21,775	123,773
Guijo	14,107	14,231	18,579	17,279	7,841	19,701	15,650	16,685	16,857	17,301	158,231
Yakal	8,225	8,150	14,491	21,770	5,593	15,115	14,714	16,471	11,963	9,162	125,654
Ipil	13,717	12,296	17,237	15,791	7,535	17,602	12,089	14,147	16,629	15,498	142,541
Molave	8,923	7,978	9,991	9,363	4,783	9,753	10,546	10,788	13,582	22,233	107,040
Narra	5,744	4,996	8,474	8,877	3,941	8,467	9,868	7,970	5,904	7,848	72,089
Kalantas	3,174	1,368	938	3,320	886	2,423	1,999	4,574	7,381	4,975	31,038
Palosapis						2,222	1,631	2,723	3,042	8,863	18,481
Manggachapui						1,469	1,859	2,666	2,916	2,214	11,124
Dungon	2,453	1,693	1,213	931	601	2,199	1,467	1,127	1,592	1,318	14,594
Tindalo	954	1,018	794	932	484	914	1,181	1,115	1,145	826	9,363
Akle	809	867	1,295	1,690	729	1,287	1,498	1,088	798	870	10,931
Lumbayau									6,085	4,415	10,500
Pagatpat									1,502	849	2,351
Other species:											
First group	574	322	707	1,000	687	2,196	2,190	3,074	1,084	1,416	13,250
Second group	6,667	6,644	7,988	8,543	3,266	9,373	6,940	7,938	6,432	7,779	71,570
Third group	8,316	10,927	11,796	8,711	2,999	7,557	6,920	5,214	9,895	8,611	80,946
Fourth group	36,786	41,655	42,981	59,855	25,613	73,017	60,130	56,738	47,661	80,933	525,369
Total	176,758	182,945	225,548	277,171	101,502	294,758	276,268	341,442	366,891	382,060	2,625,343

TABLE NO. 3.—*Revenues derived from the sale of forest products and expenditures of the Bureau of Forestry since its organization, April 14, 1900.*

Fiscal Year.—	Revenue.	Expense.	Surplus.	Expense.
				Per cent.
1901 to 1906	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913	390,664	227,048	163,616	59
1913 (July to December 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
1917	536,328	281,126	255,202	53
1918	650,692	334,254	316,438	51
Total	6,985,174	3,760,138	3,225,036	53.83

TABLE NO. 4.—*Revenue from sale of forest products, January 1 to December 31, 1918.*

Province.	Charge on forest products.							Total.
	Timber.					Firewood.		
	First group timber, ₱2.50 per cubic meter.	Second group timber, ₱1.50 per cubic meter.	Third group timber, ₱1 per cubic meter.	Fourth group timber, ₱0.50 per cubic meter.	Bakauan and tangal, 20 centavos per cubic meter.	Other, 10 centavos per cubic meter.	Minor products.	
Abra	₱2,308.67	₱1,046.65	₱168.05	₱216.54	₱27.50	₱248.35	₱65.29	₱4,081.05
Agusan	335.61	32.08			10.33	57.00	973.85	1,408.87
Albay	2,277.06	1,224.33	2,575.52	1,719.22	865.13	508.39	3,222.78	12,392.43
Ambos Camarines	1,175.90	1,316.20	3,173.69	2,233.48	2,060.75	2,260.28	11,424.55	23,644.85
Antique	220.34	76.15	89.30	136.17		18.10	224.31	764.37
Bataan	47.71	2,230.86	9,863.38	5,415.21	697.99	3,125.02	1,968.49	23,348.66
Batanes								
Batangas	950.54	281.25	169.66	127.56	18.75	680.82	1,988.92	4,217.50
Bohol	461.60	109.43	54.66	434.44	903.32	1,313.10	362.52	3,639.07
Bukidnon	16.40	4.08						20.48
Bulacan	1,119.84	1,180.45	1,102.62	4,071.51	107.48	647.14	1,068.48	9,297.52
Cagayan	13,908.93	1,435.97	2,297.56	1,000.32	129.00	503.08	10,611.95	29,886.81
Capiz	280.06	229.06	372.14	1,716.05	1,194.82	1,767.84	712.77	6,272.74
Cavite				3.90		594.74	225.95	824.59
Cebu	722.60	487.14	137.45	634.19	1,675.67	974.41	851.15	5,482.61
Cotabato	8,346.58	3,886.48	1,063.82	2,804.87	71.67	87.12	124.77	16,385.31
Davao	1,251.99	65.67	55.75	291.82	260.00	517.97	1,387.58	3,830.78
Ilocos Norte	964.20	328.77	127.28	155.76	100.89	80.20	144.05	1,901.15
Ilocos Sur	16.11	47.24	20.92	14.87	1.50	148.08	623.88	872.60
Iloilo	1,699.96	973.80	637.55	913.04	1,266.28	4,178.66	3,010.91	12,680.20
Isabela	8,755.32	2,336.49	952.53	368.73	69.70	85.64	110.94	12,679.35
Laguna	60.84	432.22	1,364.87	1,990.03	6.80	685.84	1,166.23	5,706.83
La Union	276.32	161.46	47.61	21.90	1.60	10.69	333.78	853.36
Lanao	103.17		4.82	69.43	3.00	65.81	84.97	331.20
Leyte	4,727.90	1,115.79	2,520.39	4,677.71	1,355.07	152.45	2,388.30	16,937.61
Manila	39,047.24	16,256.66	64,531.45	57,817.92	1,972.23	1,783.09	4,383.78	185,792.37
Mindoro	2,479.75	1,873.22	333.50	1,530.23	292.12	399.46	2,260.62	9,168.90
Misamis	725.60	291.24	149.82	625.86	29.74	26.79	996.78	2,845.83
Mountain Province	814.39	280.83	114.56	6,054.08		2,446.86	649.07	10,359.79
Negros Occidental	2,275.59	838.22	1,116.85	3,561.66	2,886.32	1,582.69	4,970.42	17,231.75
Negros Oriental	382.47	213.86	116.29	274.34	3.80	256.24	3,749.09	4,996.09
Nueva Ecija	2,167.47	426.08	39.41	324.30	25.66	281.86	1,920.20	5,184.98
Nueva Vizcaya	585.97	6.26	5.10	80.04			3.40	680.77
Palawan	362.56	21.21	3.36	4.96	180.55	25.00	2,382.53	2,980.17
Pampanga	439.11	562.19	883.85	505.55	53.45	257.51	295.56	2,997.22
Pangasinan	3,689.34	3,604.28	3,156.18	1,232.00	2,084.59	838.82	971.85	15,577.06
Rizal	171.95	167.35	119.18	924.91	46.20	1,373.93	2,072.21	4,875.73
Romblon	185.15	35.25	132.01	537.00		3.75	416.28	1,309.44

Samar	1,322.17	1,438.76	1,327.12	1,382.13	860.71	164.79	2,852.52	9,348.20
Sorsogon	5,913.55	1,957.96	1,786.56	4,164.85	1,243.46	817.10	4,286.22	20,169.70
Sulu	6,513.13	544.88		309.32	863.65	8.25	375.66	8,614.89
Surigao	733.58	176.57	227.17	369.78	240.10	34.18	2,148.92	3,930.30
Tarlac	263.70	102.24	25.14	24.01	31.65	1,102.81	969.34	2,518.89
Tayabas	47,346.82	5,286.95	4,153.16	2,455.02	6,995.63	5,113.56	13,348.37	84,699.51
Zambales	1,087.95	833.52	2,197.01	498.50	481.04	972.93	933.00	7,003.95
Zamboanga	11,806.76	7,361.92	11,284.51	16,948.32	1,265.90	120.38	4,158.35	52,946.14
Total charges	158,649.14	56,275.06	112,129.41	117,358.26	26,963.48	31,327.23	86,282.36	588,984.94
Total fines and penalties	19,692.76	5,005.96	6,372.39	11,283.27	3,420.57	4,993.50	10,938.23	61,706.68
Grand total	178,341.90	61,281.02	118,501.80	128,641.53	30,384.05	36,320.73	97,220.59	650,691.62

TABLE NO. 5.—*Timber licenses in force during fiscal year 1918 (January 1 to December 31, 1918.)*

Province.	Timber licenses.					Gratuitous licenses.				Total.
	For less than 100 cubic meters.	For 100 cubic meters and less than 1,000 cubic meters.	For 1,000 cubic meters and over.	License agreements.	Total commercial licenses.	For personal use. Inside communal forests.	For personal use. Outside communal forests.	For public works.	Miner's gratuitous licenses.	
Abra	42	50			92		15	3		18
Albay	8	26	10		44	40	92	1	1	134
Ambos Camarines	26	60	6	1	93	21	21	4	20	66
Antique	7	2			9	5		1		6
Bataan	42	33	21	1	97	1		4		5
Batanes										
Batangas	8	11	1		20		2			2
Bohol	14	10			24	9	22	8		39
Bulacan	2	61	3		66		16	5	8	29
Cagayan	6	103	6		115	43	19	10	3	75
Capiz	29	46	2		77	14	4	6		24
Cavite										
Cebu	11	10	2		23	11	19	2	2	34
Ilocos Norte	35	26	3		64	20		9		29
Ilocos Sur	14				14	12	1	4		17
Iloilo	8	28	2		38	1		1		2
Isabela	52	32			84	49	14	8		71
Laguna	33	43	2		78	5	20	2		27
La Union	3	6			9	24				24
Leyte	51	75	7		133	58	192	8		258
Mindoro	19	55	12		86	1	70	1		72
Misamis	19	7	2		28	11	47	2		60
Department of Mindanao and Sulu:										
Agusan	6	9	2		17	2	37	2	1	42
Bukidnon		1			1					
Cotabato	3		4		7					
Davao	34	29	1		64			3		3
Lanao	11		2	1	14			3		3
Sulu	1	3	8		12			1		1
Zamboanga	33	18	15	2	68	9	62	4		75
Mountain Province	98	19	8	2	127	7	28	10	8	53
Nueva Ecija	21	33	2		56	32	12	2		46
Nueva Vizcaya	16	1			17		24	1		25
Occidental Negros	13	50	11	2	76	9	4	2		15
Oriental Negros	9	14	1		24	12	4	1		17
Palawan	17	4	34		55		30	4	2	36
Pampanga	1	13	2		16			3		3
Pangasinan	28	83	1		112	31	16	8		57
Rizal	13	21			34	2	1			3
Romblon	6	11	1		18	1	12	2		15
Samar	53	62	5		120	119	35	4		158
Sorsogon	64	61	5		130	5	87	3	10	105
Surigao	46	3	4		53	18	29	3	1	51
Tarlac	4	11	1		16	13	48	1		62
Tayabas	50	140	34	1	225	45	5	6	3	59
Zambales	14	30	14		58	19		3	1	25
All provinces								1		1
Total	970	1,300	234	10	2,514	649	990	146	60	1,845

NOTE.—In Cagayan, Isabela, Nueva Vizcaya, La Union, Abra, Mountain Province, Ilocos Sur, Pangasinan, and Nueva Ecija, 1,014 licenses were issued for building tobacco curing houses.

TABLE NO. 6.—*Report of utilization of forest products from public forests of the Philippine Islands during the fiscal year 1918 (January 1 to December 31, 1918).*

Province.	Timber.					Firewood.		Charcoal.	Dyewood.	Tanbark.	Dyebark.
	Group.				Total.						
	First.	Second.	Third.	Fourth.		First class.	Second class.				
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*
Abra	777	696	141	434	2,048	12	2,752				
Albay	891	595	1,599	1,622	4,707	3,339	3,089	15		246	
Ambos Camarines	574	2,138	6,307	6,009	15,028	11,258	41,753			232,118	2,330
Antique	50	14	38	125	227	180	114			8,392	
Bataan	43	2,842	32,473	31,892	67,250	4,139	45,224	1,407		4,260	388
Batangas	83	68	44	74	269		14,168	1		55,225	
Bohol	137	229	35	844	1,245	10,045	14,096			9,399	
Bulacan	314	710	1,112	5,503	7,639	1,003	6,222	2,414		27,433	
Cagayan	4,968	680	1,613	1,481	8,742	458	5,177			30,151	9,000
Capiz	148	46	254	2,066	2,514	7,254	53,910	200		8,809	1,032
Cavite				4	4		9,900	132		22,891	
Cebu	95	80	107	589	871	465	6,001	125		22,968	
Ilocos Norte	312	176	101	273	862	122	2,126			75,352	
Ilocos Sur	6	3	4	20	33	4	3,701			90,297	
Iloilo	103	29	124	680	936	2,540	40,179	260	323,331	350,883	
Isabela	2,602	969	625	537	4,193	9	824				
Laguna	18	192	500	703	1,413		7,183	5,403		48,420	
La Union	86	78	24	2	190	4	200			68,924	28,000
Leyte	1,404	422	1,811	6,125	9,762	4,386	3,408	44		50	235
Mindanao and Sulu:											
1. Agusan	156			7	163		3				
2. Bukidnon	8			8	16			10			
3. Cotabato	2,802	1,586	790	3,688	8,146	455	696				
4. Davao	321	35	759	2,520	3,635	366	1,107	240		1,864	
5. Lanao	25	147	6,616	14,002	20,790		395				
6. Sulu	1,424	201		297	1,922	1,562	281	34		101,822	
7. Zamboanga	2,980	3,049	8,047	24,271	38,347	1,075	5,046	290		162,097	
Mindoro	1,963	5,182	1,369	3,703	12,217	7,408	8,947			84,884	25,981
Misamis	241	146	113	739	1,239	162	367			6,007	40
Mountain Province	583	251	1,305	9,981	12,120		20,375	25		23,219	
Negros Occidental	1,156	912	15,844	59,048	76,960	12,236	15,500	241		4,700	42
Negros Oriental	184	118	69	199	570	19	1,372			700	
Nueva Ecija	668	277	142	420	1,507		10,396	74		23,979	78
Nueva Vizcaya	123	20	4	2	149		702				
Palawan	12,198	2,435	1	139	14,773	614	2,681			126,046	51,925
Pampanga	98	302	911	789	2,100	798	2,249	1,148		3,515	
Pangasinan	1,223	1,811	2,119	1,660	6,813	18,615	5,461	25		127,954	1,118

TABLE No. 6.—*Report of utilization of forest products from public forests of the Philippine Islands during the fiscal year 1918 (January 1 to December 31, 1918)*—Continued.

Province.	Timber.					Firewood.		Charcoal.	Dyewood.	Tanbark.	Dyebark.
	Group.				Total.	First. class.	Second. class.				
	First.	Second.	Third.	Fourth.							
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*
Rizal	39	77	96	889	1,101	37	19,416	1,255	725	36,664	2,480
Romblon	42	20	128	1,554	1,744		15			108	
Samar	621	931	886	1,836	4,274	4,583	352			85,942	
Sorsogon	2,676	1,862	1,440	5,290	11,268	4,778	9,024	34		35,042	4,200
Surigao	552	82	173	719	1,526	3,415	1,212	16		51,052	
Tarlac	101	58	91	110	360	66	15,329	159		15,095	
Tayabas	15,703	3,531	5,833	3,455	28,522	30,749	198,063	1,476		57,380	21,895
Zambales	615	587	1,825	788	3,865	2,275	9,093	464		4,940	20
Total	57,853	33,587	95,523	195,097	382,060	134,431	588,109	15,392	324,056	1,973,786	148,764

Province.	Woodoils.	Almaciga.	Gutta-percha.	Split rattan.	Unsplit rattan.		Diliman.	Stone.	Lime stone.	Gogo.
					Over two cm. diameter.	Two cm. diameter or less.				
	Liters.	*Kilos.*	*Kilos.*	*Kilos.*	*Lin. m.*	*Lin. m.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
Abra				278	81,174	197,524			4,000	
Albay				12,535	68,409					
Ambos Camarines		1,155		1,228,425	106,773	617,685	3,713		40,240	20
Antique				11,701		50	1,161			
Bataan				177,873	21,440	374,007	4,750		4,143	4,167
Batangas				128					363,089	25,460
Bohol	197	40		5,420			130			156
Bulacan		152		34,768	207,440	513,626	160			25
Cagayan	100	62,189		737,870	961,505	822,932	1,350			2,907
Capiz		200		11,451	2,000		318			118
Cavite				50						264
Cebu				8,699						24
Ilocos Norte				2,958					28,100	
Ilocos Sur								94,906	115,562	
Iloilo		846		27,924			2,175			
Isabela				4,194	42,400	128,196				
Laguna				23,003	16,490		1,718	320		408
La Union										31
Leyte	172			139,574	42,577	140,106	11,813	709		

Mindanao and Sulu:										
1. Agusan				63,218	52,920	93,480		190		
2. Bukidnon				18,563						
3. Cotabato			896	3,426		17,260				
4. Davao		9,626		5,637						
5. Lanao				11,517		1,000				
6. Sulu				806		3,500				
7. Zamboanga		1,819	10,872	42,327	625	20,280				
Mindoro				100,997		72,350	75,222			4,214
Misamis	900			42,148		100	335			
Mountain Province				272,035	67,480			105,527		
Negros Occidental	9,519			444,820	15,752	52,180	18,216	84		4,769
Negros Oriental	54,155	7,200		270,213	24,835		2,380			6,575
Nueva Ecija				62,389	4,140	262,234	1,481			55,175
Nueva Vizcaya										
Palawan		35,146		12,522	2,850	470,065				79,076
Pampanga				35,470		36,950		692		382
Pangasinan	116			118	18,900	36,800				1,083
Rizal				133,829	1,324	10,050	817			4,541
Romblon	14,634	13,788		2,780	7,400	53,150				
Samar	5,219			194,634	8,450	2,380	8,670	5		
Sorsogon	6,534	430		360,040			14,049			1,772
Surigao	600			67,924		28,750				3
Tarlac				17,553	131,025	130,525	204			15,551
Tayabas		84,660		1,864,678	1,713,890	5,559,453	7,792	750		1,039
Zambales				1,465,571	32,050	411,525				17,416
Total	102,146	217,251	11,768	7,920,066	3,631,849	10,066,058	156,454	203,183	555,134	225,176

NOTE.—No forest products have been invoiced in the Province of Batanes during 1918.

TABLE NO. 6-*b*.—*Statement of forest products, cut or gathered from registered private woodlands during fiscal year 1918.*

Province.	Timber.					Fire-wood.	Charcoal.	Tanbark.	Dyebark.	Rattan.		White earth balls.
	First group.	Second group.	Third group.	Fourth group.	Total.					Split.	Unsplit.	
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Lin. m.*	
Albay	3	4	62	236	305	96						
Ambos Camarines						29						
Bataan	10	11	163	27	211	2,712						
Batangas	17	124	2	10	153	2,345		116,399	15,000			
Bulacan	1		1	60	62	4,008	23	611				
Cagayan						305						
Capiz				7	7	535						
Cavite						8,206	100	10,780				
Ilocos Sur		1			1			3,017				
Iloilo				6	6	1,945			3,732			
Isabela	7		10		17							
Laguna						85,622	5,388	12,570				4,780
La Union				1	1							
Mindanao and Sulu:												
1. Davao						15						
Mindoro	6	2			8							
Negros Occidental	7	92	538	557	1,194	10,612						
Nueva Ecija	170	192	16	6	384							
Palawan	123				123							
Pampanga		4	51	4	59	35,639	939					
Pangasinan	3				3	45						
Rizal	45	1	8	22	76	4,360	45	2,106		242		
Romblon			11	19	30	10						
Sorsogon	14	17	30	29	90							
Surigao	1		12	3	16							
Tarlac	113	152	18	31	314	22,893	186					
Tayabas	18	3	6	3	30	3,363						5,000
Total	538	603	928	1,021	3,090	182,740	6,681	145,483	18,732	242		9,780

TABLE NO. 7.—*Minor product licenses in force during fiscal year 1918 (January 1 to December 31, 1918).*

Province.	Firewood.	Charcoal.	Dyewood.	Tanbarks and dye barks	Wood oils.	Almaciga resins and others.	Gutta percha.	Rattan and dilliman.	Gogo.	Others.	Total.
Abra	24			1		1		18		3	47
Albay	55			7				54		2	118
Ambos Camarines	80	1		12		20		203	2	4	322
Antique	6			1				30		2	39
Bataan	51	12		1		4		93	21		182
Batanes											
Batangas	17			2		3				7	29
Bohol	27			2							29
Bulacan	5	13				3	1	30	5		57
Cagayan	39	1		3	1	37		113	1	1	196
Capiz	57	1		3				26		2	89
Cavite	7							3		1	11
Cebu	43	10		2				7	1		63
Ilocos Norte	14			1				6		4	25
Ilocos Sur	9	1		3		1				19	33
Iloilo	49	6	18	19	1	4		19	1	12	129
Isabela	18					6		31			55
Laguna	13	6				2		25	5	20	71
La Union	4	1		1					1		7
Leyte	48	1	2	3	1	2		52		43	152
Mindoro	56	4		39				81	23	1	204
Misamis	12			2				20			34
Department of Mindanao and Sulu:											
Agusan	5							36			41
Bukidnon								18			18
Cotabato	7					1	3	5		5	21
Davao	50	6		1		10		19			86
Lanao	14	1	1	3		1	2	7	1		30
Sulu	9			5							14
Zamboanga	80	3		25		7	9	58			182
Mountain Province	28	1		1		5		59		2	96
Nueva Ecija	23	3		2		1		51	48		128
Nueva Vizcaya	5		1					1			7
Occidental Negros	82	1		7	30	8		292	46	18	484
Oriental Negros	13				1			69	11	15	109
Palawan	53			45		27		38	11		174
Pampanga	9	7						5			21
Pangasinan	62	6	4	8				5	3	2	90
Rizal	32	8		3		1		22	10		76
Romblon	5			1	4	8		3	1	1	23
Samar	38			3	4	1		83		2	131
Sorsogon	78	6	2	11	2	2		93	5	2	201
Surigao	23	2		6		1		31	1	6	70
Tarlac	11	4		1				9	7	1	33
Tayabas	131	14		50		49		152	22	24	442
Zambales	59	12		6	1	6		48	18		150
Total	1,451	131	28	280	45	211	15	1,915	244	199	4,519

TABLE NO. 8.—*Statement showing the quantity and value of minor forest products exported during the fiscal year 1918 (January 1 to December 31).*

	Kilos.	Value.
Copal (almaciga):		
United States	433,441	₱126,166
Spain	3,000	1,200
British East Indies	65,682	10,208
Australasia	4,993	1,247
Total	507,116	138,821
Elemi (pili resin):		
United States	17,136	9,828
Gutta-percha:		
British East Indies	2,334	2,007
Rubber:		
United States	34,070	74,710
British East Indies	415	500
Total	34,485	75,210
Lumbang (candle nut) oil:		
United States	184,428	129,838
Sappan wood (sibukau):		
China	337,186	31,155
Hongkong	482,534	62,501
Total	819,720	62,501
Total		418,205

TABLE NO. 9.—*Statement of appropriation and expenditures Bureau of Forestry (January 1 to December 31, 1918).*

Appropriation:		
Act No. 2727	₱339,800.00	
Deficiency Appropriation Act No. 2783	12,300.00	
Total		₱352,100.00
Expenditures:		
Salaries and wages	237,581.63	
Furniture and equipment	8,000.00	
Traveling expenses of personnel	43,129.88	
Rentals of buildings and grounds	3,110.43	
Freight, express, and delivery service	2,000.00	
Printing and binding reports, documents and publications	5,000.00	
Postal, telegraph, and cable service	4,498.78	
Illumination and power service	1,567.25	
Plant and equipment repair service	1,237.38	
Contingent service	1,411.80	
Consumption of supplies and materials	24,704.59	
Travel expense of persons not Government employees	93.00	
Total expenditures		332,334.74
Balance January 1, 1919		19,765.26
Appropriation for Cebu reforestation (Act No. 2649).		
Balance January 1, 1918		2,914.41
Expenditures:		
Salaries and wages	1,046.41	
Furniture and equipment	1.55	
Traveling expenses of personnel	248.28	
Rentals of buildings and grounds	5.50	
Freight, express, and delivery service	32.95	
Postal, telegraph, and cable service	9.76	
Equipment repair service	0.45	
Consumption of supplies and materials	574.24	
Total expenditures		1,919.14
Balance January 1, 1919		995.27
Appropriation for construction of six forest stations (Act No. 2736)		5,000.00
Expenditures		1,482.76
Balance January 1, 1919		3,517.24
Appropriation for road construction, Los Baños, (Act No. 2736)		10,000.00
Expenditures		2,060.81
Balance January 1, 1919		7,939.19
Statement of Bureau of Forestry appropriations, expenditures and revenues for fiscal year 1918:		
Appropriations		355,014.41
Revenue		650,691.66
Expenditures		334,253.88
Surplus		316,437.78
Percentage of expenditures to revenue		.51

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1919

ARTHUR F. FISCHER
Director of Forestry

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Forestry

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Public Land
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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY

MANILA, *February 21, 1920.*

SIR: I have the honor to submit herewith the Annual Report of the Bureau of Forestry for the fiscal year 1919, covering the period from January 1 to December 31, 1919.

LEGISLATION

During the past year few bills touching upon forestry matters were introduced in either house of the Legislature.

Further changes in the wording and certain additions were proposed by this Bureau for Chapter 47 (known as the Forest Law) of Act 2711, which latter is the Administrative Code of the Philippine Islands. Also, this Bureau coöperated with the Bureau of Internal Revenue in requesting changes, and discussing possible changes, in the sections of the Administrative Code under the heading of the Bureau of Internal Revenue which treat of forest products.

Special legislation was proposed by this Bureau for the regulation of fisheries and touching the game laws of the Islands. Particular attention in respect of legislation was given to the question of grazing on public lands. This has become a considerable problem, there being as yet no sections of the aforesaid Forest Act applicable to the regulation of grazing.

PERSONNEL

Given the present high cost of living and considering in comparison therewith the range of salaries of the personnel of the Bureau, the most important question in the Bureau at the present time is the salary paid our men—particularly the insufficient compensation available for the rangers. It has been most difficult to hold to this service rangers of training and of worth proven in experience, for numerous requests have been made, by foreign governments and by private entities in the Orient, for Filipinos of our trained personnel, and it has been the policy to accede to such requests as far as was possible without crippling our own service. The question of higher technical personnel is also most pressing. Salaries for technically trained foresters (who usually have more than one university degree)

are not paid in proportion to their work and the expert knowledge required of them. Division chiefs are still on the same salary basis as four years ago; while salaries paid in other bureaus are in general higher than those paid in the Bureau of Forestry. Division chiefs should obtain at least ₱6,000 per annum; with the smaller salaries paid for foresters, it is practically impossible to obtain trained men from the United States. No Filipinos trained in special forestry lines are available at the present time and those at present studying in the United States will not be available for three or four years, and even these men, when they return, will have to obtain practical experience before being able to take over positions now being held by experienced American foresters. Several men in this office, besides being foresters, are trained engineers and in point of ability could very easily take hold of any district engineer's position in the Bureau of Public Works, where higher salaries are offered.

Again during the year 1919 sickness has been widely prevalent among the men of the field force and this has been a contributing factor in resignations. For other reasons, also, applications for transfer and resignation have increased, yet were generally refused, as no men were available to carry on the work. All this has made the position of the Director a difficult one, and the recommendations and statements made in the report of last year in regard to this matter still hold good.

The following changes in personnel have occurred during the year: The temporary lumber inspector of this Bureau resigned and went to the United States and a forester of this Bureau was appointed to this position. One ranger-scaler took leave of absence and went to the United States to take up advanced forestry, and it is believed that he will not return for at least three years. Two rangers were dismissed for the good of the service and five resigned. Of these latter, one took up the study of law, three went into business for themselves, the fifth accepted employment with a commercial firm.

The following appointments were made during the year: Messrs. Otto W. Pflueger and Lyman H. Taft were appointed foresters of this Bureau. (Mr. Pflueger has had six years' experience as Instructor in forestry in a University in the United States, besides having been with the forestry regiment in France during the late war.) During the year, nineteen graduates of the Forest School were given appointments as rangers. Assistant Forester Florencio Tamesis was granted a scholarship in lumbering; Forest Supervisors Nazario Peñas and Felix Franco, scholarships in logging engineering and forest management, respectively, and Ranger Luis J. Reyes, assistant to the wood

expert, a scholarship in wood technology, all three of these being sent to different universities in the United States.

The entire force on December 31, 1919, was made up of 206 employees having classified status and 101 employees rated as temporaries.

The classified force consisted of: 1 Director, 9 foresters, 1 dendrologist, 1 lumber inspector, 1 wood expert, 2 assistant foresters, 6 forest supervisors, 128 rangers, 9 draftsmen, 45 clerks, and 3 messengers. The temporary employees were: 1 temporary ranger, 1 proof reader, 5 nurserymen, 7 laborers, 5 carpenters, 2 varnishers, 72 guards, 2 watchmen, 5 janitors, and 1 chauffeur, making a grand total of 307 employees.

ORGANIZATION

A new division, designated the Division of Accounts and Property, was created, as required by the increase in the volume of financial and property work, it being necessary to give the Chief Clerk more time to devote to the duties appertaining to his position both in respect of administration and with a view to enabling him systematize the clerical work of the Bureau, which systematization was greatly needed, due to the continuing inadequacy of the clerical personnel.

Two new sections were organized under the Division of Forest Management.

EFFICIENCY

The general efficiency throughout the Bureau can not be said to have materially increased, this principally owing to the fact of the increased volume of work and the question of personnel. Such sickness as was generally prevalent, as stated above, could not be conducive to any added efficiency. Field work has been carried on to the utmost possible extent with the personnel available, yet with the tremendous increase of work during the year, it had of necessity to be held up because of lack of physically effective workers. The inadequacy in number of the clerical help, above referred to, also could not tend toward any increase in efficiency, but it is gratifying to be able to state that the clerical force has shown loyalty and *esprit de corps* in endeavoring to carry on by assuming increased duty, necessitating frequent overtime work. The undersigned feels, however, that a more or less continual overloading of underpaid clerks must finally result in a decreased efficiency throughout the entire organization.

DIVISION OF FOREST MANAGEMENT

The Division of Forest Management is charged with the use and protection of the public forests of the Philippines. The

work of this division consists in issuing licenses for forest products; inspecting the operations of licensees, and supervising the work of all field men. At the end of the year there were on the rolls of this division the following employees: the Division Chief, an Assistant Chief, four foresters, one assistant forester, six forest supervisors, one hundred and seventeen rangers, and thirty-three guards. In addition to these, there were six clerks in the license section.

Of the above named, the assistant forester and two forest supervisors are on leave of absence in the United States, where they were sent as pensionados of the Philippine Government.

During the year two new sections were organized in the Division of Forest Management: (1) A section of Inspection, under the direct charge of the assistant chief of the division, in which were enrolled five of the forest supervisors. This section, as its name indicates, is designed to insure the supervision and control of the work of the field men by means of frequent in spections. (2) A special permits section under a forest supervisor whose work consists of supervising the handling of applications and granting of special permits for the use of forest lands, such as pastures, saltworks, fishponds, etc., as provided in section 1838 of the Administrative Code, and of attending to the leasing of mangrove swamps by contract.

Owing to the lack of personnel for the proper administration of the several forest districts, due to sickness, absence on accrued leave, and to the formation of a large party for reconnaissance work in Davao, it was not possible to push the work of leasing the mangrove swamps under special license agreements. However, the organization of the special permits section in the latter part of the year revived this project and gave it new life, and it is now hoped that this work can be carried on without any setback.

FOREST DISTRICTS

The present subdivision of the Philippines into thirteen forest districts, or administrative units, has proven so satisfactory that no change was called for during the past year.

However, due to an increase in personnel, it became possible to assign rangers to establish the following new stations in the indicated Districts.

Bangued, Abra Province	District No. 2.
Tagudin, Amburayan Subprovince	District No. 3.
Katabañgan, Ragay, Ambos Camarines	District No. 6.
Virac, Catanduanes	District No. 6.
Laoang, Samar	District No. 10.

INSPECTION

During the year 1919, detailed inspections by the supervising personnel of the Manila office have been made in all thirteen districts—covering 32 stations.

District No.	Station.	Inspected by—	1919.	Report.
1	Echague	Buenaventura	Oct. 16-19	1
	Ilagan	do	Oct. 23-24	1
	Tuguegarao	do	Oct. 26	1
	Aparri	do	Oct. 27-Nov. 1	1
2	Vigan	do	Nov. 8	1
3	Baguio	Director	June	
4	Bayombong	Buenaventura	Oct. 13-14	1
	Dagupan	Peñas	July 1	
	do	Director	June	
	Cabanatuan	do	do	
	Cuyapo	do	do	
	Dagupan	Alvarez	July 1	
	Cabanatuan	do	do	
	Cuyapo	do	do	
5	Los Baños	Director		
	Calauag	Pray	March 1	
6	Naga	Peñas	May 3 and July	2
	Catabañgan	Buenaventura	Dec. 15-19	
	Naga	do	Dec. 1918	
	Legaspi	do	Dec. 1918	
	Naga	Peñas	March 21	
	Legaspi	do	March 20	
	Paracale	do	May 1	
7	Cadiz	Suyat	Dec. 15-16	1
	Fabrica	do	Dec. 16	1
	Iloilo	do	Dec. 18	1
	New Washington	do	Dec. 21	1
8	Zamboanga	Director	May 1	
	Dapitan	do	do	
	Kolambugan	do	do	
	Davao	Medina	do	
9				
10	Surigao	Director	April 30	
11	Norzagaray	Peñas	May 20	
	Moron	Franco	Jan. 25	
	Orani	do	May 1	
	Limay	do	July 1	
	do	Director		
	Orani	Buenaventura	Sept. 1	1
	Moron	do	do	1
	Norzagaray	Alvarez	Aug. 1	
12				
13	Dumaguete	Director		

The foregoing table shows that there were more forest districts inspected in 1919 than in the past year.

These inspections not only are made the occasion for thorough verification of the activities of the several employees of the Bureau making up the field force, but measures are taken to increase their efficiency, by clear explanations of the policy of the Bureau in the respective lines of work, as well as by assistance in systematic arrangement of the records and files of field offices the same as those of the Manila office.

It is hoped that with the availability of the eight supervisors provided for by the 1920 budget, each forest district can be given adequate inspection at least twice during the present year.

LICENSE STATISTICS

During the year 1919, ordinary timber licenses increased 436 in number over those issued in 1918, a total of 2,950 being in

force at the end of the year. (This does not include those which were returned or cancelled.) The increase is found to be quite evenly distributed throughout the different license classes.

In respect of gratuitous licenses, there was a decrease of 430 in the number issued during 1919. This diminution occurred in the category of licenses for personal-use cutting outside of communal forests, and undoubtedly was due to the availability of machine-sawn lumber and the excessively high cost of hand sawing.

Of licenses covering minor forest products, a total of 5,179 were issued in 1919, an increase of 660 over the previous year. Firewood licenses showed the largest increase, those for rattan coming next.

OFFENSES OF LICENSEES

Two new causes of trouble in the management and control of the timber and firewood licenses seemed to have reached maximum development during the past year. These were: (1) Trading in licenses, and (2) the attempts by licensees, or persons interested in a license, to enlarge their territory to the prejudice of adjacent licensees.

Of these, the first had reached considerable proportions, as local capitalists were readily induced to make loans on the security of licenses because of the large margin of profit on the forest products concerned. Later, when they would attempt to collect the debt, they in many cases found that a given licensee had at the same time become involved with as many as half a dozen different persons. As soon as a creditor realized his position, he would hasten to the Bureau of Forestry and apply to get the license transferred to himself. This would require an investigation and much long drawn out correspondence before the case could be settled.

The second cause of trouble is the more difficult to resolve (unless it happens that one of the licenses involved is actually and clearly guilty of a violation of the Forest Laws or the Bureau of Internal Revenue Regulations), because usually it leads to recriminations and countercharges between the licensees involved, which charges require careful investigation. It usually develops that, while all the parties concerned may be guilty of minor violations of the law, such violations are not sufficiently serious to warrant more drastic action than a reprimand.

Despite the very much greater number of inspections made, there has been a marked reduction in the amount of wasted and abandoned timber reported, and this condition is undoubtedly due partly to the greatly increased price of all forest products,

and partly to a realization, on the part of the licensees, that their operations are now almost certain to be inspected.

OFFENSES OF NON-LICENSEES

There have been very few complaints received during the past year of illegal cutting by non-licensees. This is attributable partly to the increased efficiency of the patrol work and the inspection of barrios by the forest guards and partly to the increased supervision given to their cutting areas by the majority of licensees.

CAIÑGINS

The number of illegal caiñgins reported during 1919, as compared with 1918, shows a decrease of 173. The number of

Caiñgin reported during the fiscal year 1919, (January 1 to December 31, 1919).

Province.	Reported by—		Total.	Acted on.		Total.
	Forest officer.	Municipal president.		Convicted.	Acquitted.	
Abra						
Albay	18		18	13	1	14
Ambos Camarines	35	4	39	3	1	4
Antique						
Bataan						
Batanes						
Batangas						
Bohol				6		6
Bulacan						
Cagayan	6		6			
Capiz	17		17	2	1	3
Cavite						
Cebu	40		40	2	1	3
Ilocos Norte						
Ilocos Sur	3		3			
Iloilo						
Isabela	2		2	1		1
Laguna	1		1			
La Union						
Leyte	48	5	53	16		16
Mindoro	21		21	1	1	2
Misamis						
Department of Mindanao and Sulu:						
Agusan	1		1	1		1
Bukidnon						
Cotabato	1		1			
Davao	5		5	2		2
Lanao						
Sulu						
Zamboanga	12		12			
Mountain Province	2		2			
Nueva Ecija	4		4			
Nueva Vizcaya						
Negros Occidental	57		57	24	1	25
Negros Oriental	24		24			
Palawan	19		19	1	2	3
Pampanga	1		1			
Pangasinan	54		54	16		16
Rizal	68		68	11	18	29
Romblon	21		21			
Samar	72		72	22	27	49
Sorsogon	1		1			
Surigao	6		6	1		1
Tarlac						
Tayabas	55		55	30	3	33
Zambales				4		4
Total	594	9	603	156	56	212

NOTE.—It is most probable that several of the reported cases have already been acted upon, but this Office has not been informed of the fact.

successful prosecutions, moreover, was materially greater, being 156 as against 118. These results are especially noteworthy because of the excessive price for rice and the Government propaganda for the raising of increased food crops, both of which had a very unfavorable effect on the control of caiñgins. The better conditions can be directly attributed to the increasing efficiency of the patrol work against caiñgins kept up by rangers and forest guards, and also to the cumulative effect of the instructive talks given by all rangers in the smaller barrios adjacent to the forests, in which talks the advantages of taking up a homestead, as well as the destruction caused by the caiñgin method of agriculture, are especially dwelt upon.

FUTURE SPECIAL WORK

The work of placing the tidal swamps under systematic management as rapidly as they can be surveyed, and the questions of conflicting ownership settled, will be continued.

A policy of establishing small to medium-sized mills whereever suitable conditions offer has already been inaugurated, and a party of four rangers, in charge of a forest supervisor, will be sent early in January, 1920, to the Island of Palawan to make a reconnaissance of two areas which are believed to be suitable for development.

FOREST DISTRICTS REPORTS

The following extracts are made from the reports of the chiefs of the several forest districts. Many of these contain considerable information which it would be desirable to set forth here did not considerations of space forbid. The following extracts have, however, been included to give at least a general idea of the duties of forest officers and of the principal results of their work during the past year.

District No. 1; Headquarters, Aparri, Cagayan.—In spite of the usual complaints of damage from typhoons and rinderpest, activity both in timber and in minor forest products has been very great, due to the heavy demand and the high prices paid. Owing to the installation of electric lighting plants in Aparri and Tuguegarao, respectively, several thousands of posts were required for the transmission lines of these two plants. Rattan went begging the first three quarters of the year, due to the fact that there was little or no baling of tobacco, but it rose to a very high price in the last quarter, when baling of the tobacco crop began. In addition to the sawmill already established at the mouth of the Zinundungan River in the municipality of Gattaran, Cagayan, another was installed during the past year at Abulug, Cagayan.

The attitude of the licensees in the district has become very much less antagonistic; many of them are now in friendly coöperation with the rangers to prevent the making of illegal caiñgins and generally to protect the forests.

Caiñgin making has been materially reduced throughout the district because of the activity shown by the rangers and through the coöperation of the municipal officials and many of the licensees.

The segregation of public lands into agricultural and permanent-forest types was not finished, owing to the lack of personnel, but it is hoped that this coming year will see the completion of this work. In connection with this work, 1,631.7 kilometers of trail notes were taken.

Silvicultural conditions are bad in many of the cut-over areas, owing to the excessive felling of first and second group trees; and recommendation has been submitted that the marking of seed trees be inaugurated to supersede the present requirement of a diameter limit for felling. It is, however, questionable whether there will be sufficient personnel to perform this work. Since the establishment of communal forests was authorized, forty-seven such areas have been set aside in District No. 1.

The collection of fines for infractions of the Rules and Regulations in the district amounted during the year to ₱7,244.44.

District No. 2; Headquarters, Vigan, Ilocos Sur.—During the past year, there was a great demand for lumber and consequently prices have been very high—first group timber bringing up to ₱150 per cubic meter and second group up to ₱70 per cubic meter. In spite of these high prices, the licensees were not able to get out enough timber to satisfy the demand.

Silvicultural conditions in the district have been very good, there being abundant reproduction of most of the important timber trees, both from seedlings and sprouts—though only the sprouts of Narra and Molave persist until they develop into large trees.

No forest fires of any magnitude were reported during the year and even small fires were very infrequent. As a result of this, the grasslands are rapidly being reduced in extent through the invasion of *parang* species. The taking up of homesteads in the more level grasslands is also a very material factor in reducing the extent of these areas.

During the year, there were located four new demonstration reforestation plots; at Pasuquin and Paoay, Ilocos Norte; and at Sinait and Santa Maria, Ilocos Sur; as well as two new forest nurseries: at Barrio Caniao, Bantay, and Barrio Agayaos, Santa, Ilocos Sur.

General conditions throughout the district have been very good, although there was much damage done by floods and typhoons.

District No. 3; Headquarters, Baguio, Mountain Province.—The demand for and the prices of all kinds of forest products have been excellent during the past year. A working plan for the Baguio Working Circle has been completed and submitted for approval. Under this plan the annual cut will not be allowed to exceed the amount of the annual growth, thus guaranteeing the supply of both timber and firewood for an indefinite period. The Santo Tomas concession is again being worked at capacity, the cables which it had been impossible to obtain from the United States during the period of the war having arrived and been put into use. During the past year the Yrisan concession, which was formerly held by the Benguet Commercial Company, was cancelled by the Secretary of Agriculture and Natural Resources, owing to the company's inability to carry on operations.

Little planting has ben done this year on the Antamok Streamhead Plantation, but frequent inspections have been made by forest officers, and the *Pithonia* cuttings have done very well, having flowered and fruited.

Upon the request of the military authorities, a plantation was made on the hill above their Hydro-electric plant, the object being to prevent erosion and rock-slides on the steep rocky slopes above the power plant. The work was done under contract and was supervised by forest officers; some 30,000 cuttings each of Mirasolia (*Pithonia diversifolia*) and Dama de Noche (*Cestrum nocturnum*) were planted, of each of which about 50 per cent are in good healthy condition at the present writing.

During this year the mapping of the Baguio Working Circle was completed. The map shows in detail the character of the land, the vegetation on it, the concession and license areas and other necessary data.

The only mining concern operating to any extent this year was the Benguet Consolidated Mining Company. The Acupan Mining and Milling Company was not able to resume operations, due to lack of machinery. The Hagen and Reynold's partnership was dissolved, but it is understood that other parties have taken an option on their territory.

The project for the establishment of communal forests for all the towns of the Mountain Province has, in view of the adverse recommendation of the provincial governor, been suspended indefinitely.

The number of caiñgin permits issued shows an increase of 315 over 1918, and this is gratifying to note, since it shows that

the Igorots are fast becoming amenable to the Forest Laws and Regulations.

The fire season this year has been very severe, 58 fires having been reported, covering an area of 170 hectares, with an estimated number of 38,980 pine seedlings and poles killed or injured. The city fire wardens are no longer stationed at lookout points, but have patrol routes to cover and they report the fires discovered by them to the central office by telephone.

District No. 4; Headquarters, Dagupan, Pangasinan.—The officer in charge of this district reports that although the demand for forest products was excellent and prices greater than ever before, the past year has not been a prosperous one for the licensees, due to the unsettled labor conditions caused by the food crisis and by epidemic. Further he states that, although the number of licensees increased, the production of both firewood and timber fell off slightly, due partly to the decreasing supply of these products and partly to scarcity of labor.

The Zambales Lumber Company, a new firm, was granted a twenty-year concession in Masinloc, Zambales, and a small mill was installed on their area. It is, however, their intention to erect a large modern plant and have it ready to operate before the end of 1920.

Kogon fires were reported during the year covering an estimated area of 2,800 hectares. It is hoped finally to prevent these by an increasingly rapid settlement of the kogon areas by homesteaders.

Due to the tactful treatment of the licensees by the rangers, there has been an improvement in the spirit of the licensees and thir attitude toward the Bureau.

The silvicultural condition of the forests in the district is very unsatisfactory. This is particularly true with reference to the mangrove swamps, in many of which the tree growth has been practically eliminated. This is due to excessive and improper cutting, which can not be controlled with the present insufficient force in this district.

District No. 5; Headquarters, Los Baños, Laguna.—Activity in the lumber industry has been very great in the past year, there being five mills in active operation. Of these, the mill at Calauag has made by far the best showing. The manager of this mill plans to install, during 1920, a band sawmill in place of the circular one now in use.

Due to the very high prices of firewood during the past year, many firewood licensees adopted the policy of felling everything that could be sold, irrespective of the cutting regulations imposed

in their licenses—their attitude being that, if they were caught, the extra fine would have been more than offset by the profits from the very high price of firewood.

Fires in District 5 have been very few and these not severe. No special work in mapping and surveying was undertaken during the past year, owing to the lack of personnel, but it is hoped that during the coming year several important reconnaissance projects may be carried out.

Reports have been submitted for communal forests for Baler, Mulanay and Unisan, Tayabas, and Ragay, Camarines. In addition, petitions for the establishment of communal forests have been forwarded from several other towns to the local forest officers for appropriate action.

District No. 6; Headquarters, Naga, Ambos Camarines.—The Christmas typhoon of 1918, with its resultant damage, had created a great demand for timber for repair work. This gave the lumber industry a big impetus during the early part of the year 1919. During the middle part of the year, the operations of the timber licensees were greatly reduced, owing to the sickness of both men and animals, as well as by the extreme food crisis. With the exception of the timber gotten out by the licensees on the northwestern coast of Camarines, practically all the timber is used locally. The Katabañgan sawmill increased its capacity, during 1919 and now turns out over 10,000 board feet daily, practically all of which is shipped to Manila. In connection with the increased activity of this mill, a new forest station was opened at Katabañgan. The licensees in the eastern part of Albay have been very busy furnishing ties, poles and posts for the extension of the southern line of the Manila Railroad from Legaspi to Naga.

The rattan industry fell off during 1919, owing to the decline in hemp, the baling of which is the principal use of the local supply of rattan.

Two important surveys were undertaken during the year, one being the reconnaissance of the mangrove-swamp area of Viga, Island of Catanduanes, under the supervision of Ranger Salvoza, and the other that of the Daet swamps in Camarines.

The total number of ordinary timber licenses in force in the district remained practically the same, but there were numerous changes among the persons holding them, 33 new ordinary timber licenses being granted and 33 gratuitous licenses being cancelled. The one existing license agreement in the district was altered, during the first half of the year, to cover only about one-half of the former area, the portion which was alienated being opened up to ordinary timber licensees.

Six new communal forests were established during the year and two applications therefore are pending inspection.

As a result of coöperation between the municipal and provincial governments to the end of forcing the people to cultivate the kogon and brushland of the district with food crops, much of the waste land of the province has been planted, and it is hoped that in the near future the importation of food crops from outside will by much lessened.

District No. 7; Headquarters, Iloilo, Iloilo.—The lumber industry has enjoyed an unprecedented boom in this district, the large demand from the new sugar centrals for lumber, piles, ties, etc., having given the licensees more orders than they could fill. In spite of this, the prices of sawn lumber averaged lower than the preceding year, due to the establishment of the new lumber yards in Iloilo, breaking the monopoly enjoyed by the single lumber yard existing in 1918. With the exception of those handling first and second group lumber, the people dealing in handsawn lumber have been compelled to give up business, due to the high cost of labor. Firewood has been at a premium in Iloilo and was bringing at the end of the year as much as ₱100 per thousand "rajas" of bakauan. The market for sibukau, almaciga and bayones has been very weak, with prices very low. Split rattan and balau have maintained steady prices.

Forest fires have been reduced to a minimum, owing to the extremely long rainy season. There was but one fire of any importance and that one occurred in the timber section near Pontevedra, Capiz. The damage was small.

There was a substantial increase in the number of licenses granted, both for timber and minor products, during the year and a decrease in the number of gratuitous licenses issued. One new sawmill has been added to the two mills already operating in Negros. The new one is the property of Mr. Walter A. Smith, who is logging part of the area under the Insular Lumber Company's concession and partly on private woodlands.

District No. 8; Headquarters, Zamboanga, Zamboanga.—Cutting was started on the Jolo Teak Reserve the past year by the provincial government of Sulu. Also, over 25,000 ties, mostly of first group timber, were shipped from Sulu Province in one month last year. Transportation facilities have improved during the year, although freight rates were rather high. The Olutanga Lumber Company has almost completed a schooner of its own for transporting its lumber to the Manila market. Information secured from six of the largest mills in the district shows that 49 per cent of the lumber shipped by them went to Manila, while

of the remainder, Cebu received 15 per cent, Zamboanga, 12 per cent, miscellaneous ports in Mindanao and Sulu, 19 per cent, other provinces and Shanghai, China, 5 per cent.

The reconnaissance under the direction of Forester Medina with a crew of sixty men, including laborers and students, covering the whole of Davao Province, was begun in March and completed in June. The detailed report will be found in this report under the Division of Forest Lands and Maps.

Ordinary timber licenses in 1919 showed a substantial increase in number over those issued in 1918, while the number of gratuitous licenses fell off by 100. Minor products licenses also showed a substantial increase, there being 512 granted in 1919 as against 370 for 1918.

Substantial increases in the number of homestead, lease and purchase applications were noted during the year 1919.

Five new communal forests were established during the year and two proposed forests were surveyed. One communal forest was certified as more valuable for agriculture than for forest purposes and has been opened for entry under the homestead laws. A new forest is to be located in replacement of the one abolished.

More timber has been cut during the past year by the mills in this district than in any previous year. Two new twenty-year concessions were granted during the year: One to the Basilan Lumber Company, on Basilan Island, and one to the Olutanga Lumber Company, on Olutanga Island, Zamboanga. The mill at Lumarao, which has been idle for some time, is undergoing repairs and will be again operating before April 1st. The provincial government of Sulu purchased the mill formerly owned by Mr. Lyon and is using it to cut up the teak from Jolo. The Basilan Lumber Company has constructed during the year a new mill at Maluso with a capacity of 3,000 board feet daily. A new mill is also being erected in the city of Zamboanga, with a capacity of 2,500 board feet per day, and yet another is going up in Davao Province.

Two new forest stations were completed during the year, one at Naga-Naga, Zamboanga, and one at Port Banga, Zamboanga. During the month of May, the District Office was moved from the Custom House Building into more commodious quarters in the Murga Building, which is more centrally located.

District No. 9; Headquarters, Puerto Princesa, Palawan.—The lumber operations in Palawan have increased to a remarkable extent during the past year. The cutting is, however, confined mostly to the coast, and only Kalantas and Ipil are being logged. A reconnaissance party is to start work in Jan-

uary, 1920, and it is hoped that as a result of its work, areas will be opened up for more progressive logging. Almost all of the labor used in all operations is imported from the Visayan Provinces, since the local labor is not only insufficient, but inefficient. The best market for the timber cut is Manila—only a very small amount being used locally. In general, the silvicultural conditions are satisfactory. Reproduction is good. If licensees are kept out of the cut-over areas, the results will be very satisfactory. Fires are rare.

All classes of licenses showed an increase in the number granted over those of 1918. The licensees are also much more active, due to the high prices and better transportation facilities. There are two sawmills in the district, namely, the one at the Iwahig Penal Colony and that of Licensee Thomas A. Wallace. Neither one of these has operated during the year.

District No. 10; Headquarters, Tacloban, Leyte.—Modern lumbering methods have not as yet been introduced in this district, and although there are five sawmills at present operating, all are small. Most of the lumber produced is sold in Tacloban, but as the lumber requirements are less than the production, the price of lumber has shown a tendency to drop.

The majority of the licensees evidence a friendly spirit towards this Bureau and its representatives. Many of them are beginning to recognize the importance of the public forests, and have coöperated with the rangers in detecting and prosecuting infractors of the forest laws.

In view of the advantages accruing to the holder of a forestry license, it has become necessary to use greater care in issuing them; it is recommended that every applicant for a license be required to file a bond proportionate to the value of the stand of timber on the area applied for.

In general, the silvicultural conditions are good and the damage from windfall and insects during the past year has been negligible.

The dry season of the past year was unusually hot and dry, and several large forest fires have been reported from Masbate, where there are extensive areas of grass land. Two of these fires, the one located south of Barrio Baleno, Masbate, and the other located in Sitio Capday, about 6 kilometers southeast of Aroroy, did considerable damage, each fire spreading over about 100 hectares of forest.

Six hundred and twenty kilometers of trail notes were taken during the year. These surveys were made in connection with inspections of licenses and of public lands.

Although there was a material decrease in the number of

caiñgins reported over 1918, (i. e., 159 as against 214), the number of convictions secured was greater, 103 to 57. This is a very satisfactory showing and indicates that the propaganda directed against caiñgin makers by the rangers has begun to bear fruit.

District No. 11; Headquarters, Manila.—During the year 1919, the forest industries have enjoyed unusual prosperity. The Cadwallader-Gibson Lumber Company have been exploiting their concession on the Bataan Peninsula, working the greater part of the time day and night, and are also installing another mill at Paysawan, on the western coast of Bataan. A small circular mill has been established at Barrio Alañgan, Limay, Bataan, by Mr. M. de los Reyes. In Orani, many of the licensees have been cutting bancas (dugout canoes) instead of squared logs, as the net returns are greater and the bancas are much easier to haul out. The firewood industry has continued on the same scale as in 1918, and with good financial retruns.

With the exception of the Cadwallader-Gibson concession area, the silvicultural conditions have been very good.

The only fire of any importance reported was that above the patrol trail in the jurisdiction of Abucay, Bataan, which burned about 20 hectares of commercial forest. The authors of it were certain Christians who induced Negritos to start the fire.

The mapping work done during the year covers the Gordon-Schilling Lumber Company's concession area, the Naval Reserve and also the Macatbas-Tipo watershed. In all, 341.92 kilometers of notes were taken.

Only 66 caiñgin-makers were reported during the year, and of these 19 were convicted and 42 absolved, while 5 were pending judicial action at the end of the year. This showing is remarkably good for a district so densely populated, and indicates that, given the right kind of propaganda and the proper supervision, this evil can practically be eliminated.

District No. 12; Headquarters, Calapan, Mindoro.—There has been a good demand for lumber, with high prices ruling throughout the year, and as a result, practically every foot of accessible forest has been taken up under licenses. All mangrove swamps also were granted under license, and there has been great activity in the firewood business. While there have been some changes among the persons holding the licenses, the number of licenses has remained about the same, owing to lack of additional unoccupied territory. As a result of the demand for territory, a good many disputes arose amongst licensees for each other's territory.

The damage from fire was not great, all the fires reported being confined to the grass lands.

Very little trouble was encountered during 1919 with caiñgin-makers, but complaints were received that many homesteaders have abandoned their homesteads and let them grow up in kogon.

Forty-four parcels of public land were inspected during the year, and there are 290 parcels still pending inspection.

District No. 13; Headquarters, Cebu, Cebu.—The lumber industry has shown very material increase over last year, both in the number of licenses granted and the amount of timber cut. Only first-group woods and some of the hard woods of the inferior groups are being cut, but they find a ready market in Cebu. An exception to this is to be noted around the new coal mines which have been opened up, where they have been using all classes of timber in their development work. There has been very little competition between the lumber companies and licensees, since their products are so different. Prices for all forest products were very high during the year, and conditions in the lumber business, in general, were good. The mangrove swamps are being heavily overcut, but good reproduction has taken place on most of the areas.

THE OFFICE OF THE WOOD EXPERT

No radically new line of work was initiated in this office during the year, but along certain lines the amount of routine work was increased notably, especially in that of checking up the auxiliary invoices.

BOTANICAL AND WOOD COLLECTIONS

Three hundred and seventy-eight botanical specimens were received, of which 217 were accompanied by wood specimens. About one-half of these were collected by the Davao Province reconnaissance party and among these were a number of species not previously represented by wood specimens in our collections. Of the wood specimens without botanical material received during the year, 129 were of sufficient interest to be recorded in the trade sample register. Many of these were received in reply to letters sent out to request specimens of woods recorded in auxiliary invoices under unfamiliar local names.

OTHER ACCESSIONS

One hundred twenty-six phenological reports, containing 305 names, were received and the new names found in them recorded. Eleven new ten foot planks were received and installed and 26 floor specimens (logs), the latter of about 15 species, mostly new

to the collection; beside these, a number of new six foot planks were worked up from old material. Also, there were received between 40 and 50 specimens of bamboos, rattans, seeds, basts, and small manufactured or partly manufactured articles of wood or other forest products. One hundred sixty-three numbers were added to the collection of foreign wood specimens, the total in the catalog being now 1855.

HAND SPECIMENS

For the first time in the history of the Bureau, a system was devised and put into practice for supplying every forest station with a complete working set of hand specimens for the use of forest officers, for study and for identification of local timbers. All the old collections existing at various stations were called in and those which were recognizable were relabeled. New sets were prepared, the nucleus being about 100 of the most important and widely known species, which were distributed to all stations. To these were added, for each station, specimens of all the available material from the regions in which the stations are located, which, including often several pieces of one species of distinct character or of different origin, brought the total up to an average of about 180 for each station. These specimens were shipped to the stations in neat cases having hinged doors, to provide a place in each station where the specimens will at once be kept together and be easily accessible. In addition to this, a set of pigeon holes, one for each station, has been prepared in the Manila office, in which new material is distributed as it comes in and is worked up, the resulting additional collections being shipped from time to time to the respective stations. The total number of specimens shipped to the 57 stations outside Manila and Los Baños was over 10,000. The Manila Forest Station has, of course, access to the entire collections in the office and the Los Baños Forest Station to the collections at the Forest School.

Following is the complete record of all hand specimens issued during the year:

Forest Stations	10,370
Forest School (for Class of 1920)	2,530
Sold	1,059
Distributed gratis	4,605
Total	18,564

Those sold and distributed gratis outside of the Islands went, as far as is known, to the following countries: Argentina, Australia, Borneo, China, England, Federated Malay States, France,

Holland, India, Japan, Russia, Spain, Sumatra, and the United States.

There were available for distribution, at the end of the year, duplicates of over 300 species.

SHOP WORK

The situation as regards high cost of furniture made in commercial shops has not improved at all; in fact, prices of almost all kinds of furniture in Manila were higher in 1919 than in the previous year, while seasoned lumber is almost unknown in the market. Consequently, the policy of making office furniture in our own shops has been continued and even more work was done along this line than in previous years. The cost of running the shop, as regards wages of workmen, has not increased materially and by selecting fairly well seasoned lumber from the stocks at the Bureau of Supply lumber yards, the work, as regards both quality and cost, is much better than certain pieces of furniture obtained during the year from outside sources. Following is a list of the principal piecies of office furniture and equipment made during the year: Counter before Chief Clerk's and License Clerk's desks; racks for 6 foot planks; 18 typewriter tables; 37 office tables, 3 by 5 and 3 by 6 feet; three flat top desks; 75 hand specimen cases for Forest Stations; four finely finished traveling hand specimen cases for pensionados in the States; 22 drawing boards and 30 T-squares for Forest School; shelving in upper chamber of fireproof vault; 75 chairs for Forest School; about 45 picture frames for Manila office and Forest Stations; 30 Biltmore sticks for Forest School; equipment of three knock-down tables, 3 by 8 feeet, 12 collapsible benches, and 10 packing cases, for Davao reconnaissance party; crates for about 60 specimen cases shipped to stations; about a dozen racks for museum specimens, books, maps, etc.; and minor repair jobs, packing cases, crates, etc., too numerous to classify.

IDENTIFICATION, INSPECTION AND GRADING

Several hundred specimens submitted by forest officers or other Government agents and by private parties were identified, of which, as mentioned above, 129 were considered of sufficient interest for permanent record. An interesting and valuable feature of this work is the identification of wood specimens collected with fungi. Members of the College of Agriculture and of the Bureau of Science who are studying fungi, especially wood-destroying species, submitted during the course of the year several hundred more or less decayed specimens, of which it was possible to identify about 75 per cent, thus establishing the iden-

tity of the hosts on which the fungi grew. For railroad companies and sugar estates, 41,243 ties were inspected and identified. Sixty-three long Apitong logs, exported to China by a lumber firm, were inspected for identification. No requests for grading other export lumber were received during the year.

COÖPERATION AND EDUCATION

About 10 exhibits of forest products were made at Arbor Day and Garden Day celebration, in coöperation with the Bureau of Education.

COLLECTING AND RECORDING DATA

The checking up of auxiliary timber invoices, formerly entirely in the hands of the license section, who only consulted this Office occasionally in doubtful cases, was during the early part of the year taken over entirely by this Office. The result has undoubtedly been good both from the point of view of properly collecting the revenue, as also from that of information obtained. The rangers detained to the wood expert's office have a more intimate knowledge of the local names commonly used in the invoices than do the clerks in the license section, thus making errors in identification less frequent, and, in addition to this, whenever an unknown or doubtful name is found in an invoice, a form letter requesting a wood specimen for identification is made out at once and sent to the licensee. Through the replies received, a large number of wood specimens with authentic local names have been added to our collections.

PUBLICATION

The wood expert and his assistants have revised the common names of plants in all the manuscripts of the series of minor forest product bulletins now in course of publication, introducing throughout a uniform system of phonetic spelling which, it is hoped, will be carried out in all future publications, so that, in time, we will have a uniform and consistent standard for spelling all the official and local names.

DIVISION OF INVESTIGATION

This division was handicapped during the year because of the lack of men for research work, besides having to carry on the work of the Forest School in connection with that of the division.

The main activities of the Division of Investigation have been centered along three lines: (1) The preparation and completion of minor forest products bulletins; (2) the writing of a flora of Mount Makiling; and (3) the compiling of a report on reforestation.

MINOR FOREST PRODUCTS BULLETINS

The original idea in the compilation of data on minor forest products was to issue as complete an account as possible of all minor forest products and to have this so arranged and indexed so that it could be consulted either from local names, scientific names or products. As it was impossible to prepare the whole work at one time and as, moreover, the work naturally divided itself under certain distinctive headings, it seemed best to issue first separate bulletins dealing with the several subjects respectively, and afterwards to combine these as sections with additional material and publish as one the complete work. The publishing of the individual bulletins has enabled us to make use of appropriations which were not large enough to cover the expense of the complete volume and to save the type and plates for the preparation of the complete work; also it is believed that this method will result in a considerable saving, since many persons interested in minor forest products will need but one or two of the bulletins of the series. During the year the following minor forest products bulletins were sent to the printer:

BULLETIN No. 18. Philippine Palms and Palm Products.
BULLETIN No. 19. Philippine Fiber Plants.
BULLETIN No. 20. Philippine Resins, Gums, Seed Oils, and Essential Oils.
BULLETIN No. 21. Wild Food Plants of the Philippines.
BULLETIN No. 22. A complete minor forest products bulletin to be issued in two volumes.

THE FLORA OF MOUNT MAKILING

Very satisfactory progress was made during the year on the preparation of a Flora of Mount Makiling, and it is believed that this will soon be ready for publication. This flora will supply a long-felt want in the Forest School, where the students have been handicapped by the lack of a publication which would enable them to identify the woody plants of the region.

REFORESTATION BULLETIN

The Division of Investigation has had work on reforestation under way for a long time, and enough results have been secured to warrant the issuing of a publication on reforestation. This should be very useful alike to the general public, the employees of the Bureau, and to the students of the Forest School. In preparation for this bulletin, all of the trees in the extensive plantations at Los Baños have been numbered and accurately measured, and it is hoped that the coming year will see the completion of this bulletin.

Three and three-fourths hectares were added to the experimental plantations at Los Baños, the site of the Division of

Investigation and Forest School. Another effort was made to reforest the kogon hillside on the Mount Makiling Reservation with Ipil-ipil cuttings and seedlings. The small seedlings of one centimeter in diameter were the only plantings which survived and steps have been taken to reforest the area with the small seedlings, which gave good results in the past year. The areas broadcasted with Ipil-ipil seeds in 1914 are showing good results and the kogon grass (*Imperata exaltata*) is on the wane. The talahib (*Saccharum spontaneum*) has not been affected as yet.

In coöperation with the district forester, a plan has been inaugurated to control caiñgins by requiring the occupant of the land to plant forest trees. The first clearings under the new plan will be made in 1920. During 1919 and even earlier, plantations of Lumbang (*Aleurites moluccana*) were made in the Calamba Estate Addition of the Mount Makiling Reserve, but as these were on agricultural land it was thought best to modify the procedure and require planting to be done upon designated areas rather than upon the land occupied.

The nursery will be transferred during 1920 to a site near the school. There are many seedlings on hand, most of which are required for the reforestation just mentioned.

Total number of seedlings living..... 18,045
Total number of cuttings living..... 707

Species planted.—Bagilumbang (*Aleurites trisperma*), Banuyo (*Wallaceodendron celebicum*), Firetree (*Delonix regia*), Kamachile (*Pithecolobium dulce*), Lanutan I (*Bombycidendron vidalianum*), Lumbang (*Aleurites moluccana*), Malaruhat (*Eugenia sp.*), Narra (*Pterocarpus spp.*), Sibukau (*Caesalpinia sappan*), Teak (*Tectona grandis*).

There is a new trail along the Molawin Creek connecting the Foxworthy Arboretum with the Forest School. Another trail has been built from the school to Paliparan. This trail will serve as a patrol trail and eventually will be made a horse trail to Camp Eldridge.

Material was gathered for the repair of the cabin on the summit of Mount Makiling and the work will be completed as soon as possible.

The work for 1920 will consist of laying out a new nursery, inaugurating a complete plantation record, studying growth requirements of different species as shown in the plantation, and rattan studies both at Cavinti and on Mount Makiling.

SILVICULTURE

Nurseries.—The size of the nursery remains the same as was last year. No attempt to enlarge it was made as it is expected

soon to abandon it and establish a new one near the Forest School, within the Makiling Forest Reserve. The nursery work was kept up and handled by three men. In December, 1919, there were in the nursery 18,045 seedlings and 707 cuttings.

Plantations.—During the year 1919, $3\frac{3}{4}$ hectares were added, making the total area of the plantations $83\frac{3}{4}$ hectares. The cost of upkeep for the year was ₱989.50. The separate items of expense are as follows:

Clearing and cleaning	₱592.70
Cleaning the rides	318.00
Planting	141.80
Total	989.50

Measurement of trees in the plantations.—In order to obtain more definite data on growth, every planted tree in the plantations was tagged and its diameter and height measured. In addition to this, the regular measurement of the best trees of the different species was taken as heretofore.

Growth studies.—The yearly measurement of about 590 trees of Bagtikan, White Lauan, Taluto, Katmon, Guijo, Tamayuan, Duñgon and Camagon, begun in 1913, was continued. Also every tree in the pure stand of Bagtikan near the Forest School was measured. These data, together with that obtained from the plantations, will be published as soon as additional men are secured to relieve the members of the division from the Forest School work. Experiments were started on the determination of the growth of unit areas on Mount Makiling.

Silvical leaflets.—In connection with the class in Silviculture, 21 silvical leaflets, dealing with the species grown in the plantations, were prepared, making the total number of these leaflets 216. These leaflets contain valuable information concerning the species treated.

Reproduction studies.—The reproduction plots in the cut-over areas of the Cadwallader-Gibson Lumber Company in Limay, Bataan, established in 1913, were inspected this year. Data on the growth of certain of the species found in the plots were taken and the results are expected to be published in the near future.

Cost records.—Additional data on the cost records of planting and other work were gathered.

FOREST MANAGEMENT, ENGINEERING AND UTILIZATION

Durability tests.—The work on the durability tests of wood is still in progress, although no additional material was

furnished. The tests on bamboos show unquestionably that the preservatives used had no effect toward increasing the durability of the bamboos and it seems probable that no preservative of any kind will ever preserve bamboos in the ground for more than two to three years. The difficulty lies in the impenetrability of the outer, compact, more or less solid and hard layer; the inner layer, though readily impregnable by most preserving materials which might keep it immune, is valueless, for this portion is naturally soft and weak.

Wood preservation.—No work was started in this direction, due to the lack of creosote or any other preservative materials.

THE WORK IN BAGUIO

The working plan for Baguio, the hill station of the Philippine Islands, has been completed, approved, and is now in operation.

NURSERY

The demand for the plants from Nursery was greatly reduced this year, the records showing that only 2,117 plants were given out during 1919. Of this number 590 were taken by private parties, 1,164 plants were used on the parks and roads and 363 plants were given for the Trinidad Agricultural School. The demand from the various gardens was greatly reduced.

There are now available for use 10,000 trees, 15,000 shrubs and shrubby trees and 800 vines, with over 5,000 ornamental and flowering plants.

The planting program of the year 1919, as also for the coming year, was hindered by the scarcity of seed of *Pinus insularis*. From June to September, over 2,000 plants and thinnings from the nursery rows and 957 small trees were set out in the experimental plantation area.

The rains having ceased early during the past year, there was a very serious water shortage, and this had its effect upon the nursery, inasmuch as there was scarcely sufficient water for bathing and culinary purposes, with no water available for sprinkling during the period when the plants were in greatest need of it. In coöperation with the City Engineer, the Bureau planted up quite a few of the stream sources in denuded areas.

Such seeds and plants were ordered from Japan and the United States as in the past had been grown successfully in Baguio. Of the economic species on trial, *Cinnamomum camphora*, the camphor of commerce, has shown excellent results and the Bureau is now taking steps to increase the planting of this

species and use it for reforestation purposes. The exotic species which have been successfully established in Baguio are being propagated from cuttings and from imported seeds.

CITY AND PARK IMPROVEMENTS

Spot planting with local pine was started near Military Circle. Paths were laid out, by expert Igorot stone cutters, from the metalled road to the district office, and these stone cutters will be employed for the construction of permanent bridges and culverts in this part of the city in order to do away with the frequent repairs needed where pine lumber has been used in construction.

Improvement thinnings and pruning were begun for securing clean boles and also with the secondary purpose of disposing of the firewood so obtained to the needy residents at cost. Starting this in Forbes Park, it is intended to continue throughout the city and forests.

Turpentine extraction is to be tried on the old trees on Forbes Park, where removal of such trees within the next five years is silviculturally necessary. One new cottage has been constructed in Forbes Park with old material on hand. It was found necessary to reduce the allotment of expenditures for the various projects in the city of Baguio.

To reduce the fire danger the grass was cut in all parks. During the typhoon season, plants on Session Road, the Forest Station and in and around the city of Baguio were pruned and supported. The City Hall, Session Road, Wright Park and the avenues extending to the Mansion House received a substantial addition in ornamental trees and hedges. Burnham Park suffered heavily from the overflowing of the lake and much of the planting was destroyed. A serious fire occurred over the City Cemetery, killing about 130 good-sized saplings and trees.

The working plan has shown that the annual cut of 25,000 cubic meters from the Baguio forests is far too great and that the largest permissible cut should be 16,000 cubic meters if a future lumber and firewood shortage is to be averted. The firewood problem is of increasing importance and the high price of firewood has necessitated a very much more drastic policy along conservation lines, inasmuch as the general public persists in trying to secure cuttings in the immediate neighborhood so as to reduce the outlay for firewood, and very few can understand the reason for not having cheap wood when they see old pine ve-

terans standing on the roadsides or in Forbes Park. Following the suggestion of the Bureau of Forestry officials at Baguio, the firewood licensees have formed an association and meet once a month at the district office of the Bureau. This association has resulted in a better understanding of the aims of the Bureau and in mutual respect between the licensees, and they are coöperating in the detection of forest violations and in fire fighting. Many lot owners have consulted the forestry officers in matters relating to tree felling on their property and such persons have been accorded prompt attention; but cases have arisen where lot owners who cared nothing for the future appearance of the city have cut trees on their property and sold them for firewood. It is impossible for the Bureau to stop this practice and efforts were made to enact an ordinance whereby lot owners desiring to fell pine trees on their property would be compelled to secure permission from the city forester. This ordinance failed of passage on the ground that it curtailed the established rights of property. Some stealing of timber from private property has been the result and complaints were made to the Bureau, but it is, of course, impossible for any of the Bureau of Forestry personnel in Baguio to guard private property.

The demand for Christmas trees, saplings and poles, has also created an undesireable situation, since young trees which the Bureau desired to save, especially along the roads, were cut down by irresponsible visitors and residents for Christmas-tree purposes, even some large Japanese Cedars planted six years ago being cut down for such use, and a policy is now being studied with the object of controlling this evil.

The fire situation in Baguio during the past year has been very bad, due to the dry season, and the possibilities of controlling it are, due to the lack of money, not very encouraging. An automobile truck to carry men and equipment for fighting fire was requested in the appropriation, but denied. It has happened that, where six to eight fires started practically at the same time and no adequate transportation was available, these fires have gained considerable headway with consequent destruction before men arrived on the scene.

THE FOREST SCHOOL

During the year the Forest School was handicapped by lack of equipment and of a full teaching staff, as it was during 1918. The Class of 1919 finished its school work early, the last two months of the term being spent in the field with a party from the Bureau of Forestry. A reconnaissance of the Davao region was made. The graduating class was thus enabled to

secure valuable practical training before entering the Bureau of Forestry.

The Chinese graduate made special studies in lumbering before he returned to China.

Two foresters from the school took advantage of the departure of the Senior Class to go on leave to the United States. One returned in June in time for the opening of the school, while the other arrived in September.

One new American forester arrived in the latter part of September and was given charge of the engineering courses, including lumbering.

The Junior Class contained 21 students. Three Chinese students are included in this number. The students are from different sections of the Philippines, but especially from the provinces north of Manila, as may be seen in the following table:

Ambos Camarines	2	Leyte	1
Batangas	1	Pangasinan	10
Bulacan	1	Rizal	1
Cagayan	4	Tarlac	1
Ilocos Norte	3	Union	1
Ilocos Sur	5	Zambales	1
Iloilo	1	China	1
Laguna	1		

A professor from the College of Agriculture was secured to teach the course in Botany during the vacation period, while an instructor from the same College taught trigonometry to the Juniors for the first semester. Arrangements had been made to have the College of Agriculture teach the English courses, but because of the lack of personnel this course was handled by one of the foresters.

It is not feasible to have the students take only one course at the College of Agriculture, unless it is given as the last subject of the day, because of the interference with classes at the Forest School. The two institutions are over a kilometer apart.

The arrival of one new American forester has made it possible to give special work in woodcraft and in connection with military drill. The tying of knots, making hitches and splices, the care and use of saws and axes, first aid and swimming are taught, in addition to the usual military drill.

The courses of study have been rearranged for the purpose of concentrating on essentials and also of securing closer coördination between the several courses.

The proposed higher course in forestry is still in the future, as everything depends upon an appropriation for equipment and additional personnel. It is difficult to secure a man trained in

tropical forestry who is willing to come to the Philippines at the salary now offered.

REFORESTATION

The extensive reforestation program which was planned, but which it was impossible to carry out during 1918, was taken up again during 1919 and some headway made.

ILOCOS AND ZAMBALES REFORESTATION

The preliminary work done in the Ilocos Provinces and in Zambales during 1918 was made use of and those municipalities which forwarded resolutions to coöperate with the Bureau of Forestry were again visited and effective work started. In these provinces a total of 11,850 liters of ipil-ipil seeds was distributed for preliminary planting in the kogon areas. Nine cavans (1 cavan=75 liters) of lumbang seeds and eleven cavans of bagilumbang seeds were distributed. Fifteen reforestation demonstration plots were established in as many municipalities, the plots covering an area of about 270 hectares, while the number of nurseries established was two. Of the ipil-ipil seeds distributed, 3,300 liters went to Ilocos Norte, 1,575 to Ilocos Sur and 3,375 to Zambales Province. No lumbang seed was distributed in Ilocos Norte, but 12 cavans of lumbang and bagilumbang seeds were distributed in Ilocos Sur and eight cavans in Zambales Province. Eighty-nine hectares were put into reforestation demonstration plots in Ilocos Norte, 88 hectares in Ilocos Sur and 93 hectares in Zambales. In practically all this work free labor was available. The surrounding population, headed by the teniente del barrio or the councilor of the district, usually did the broadcasting and from seven to twelve cavans of seeds were broadcasted in one day. The average results show that ipil-ipil planted from six months to a year ago is about 20 centimeters in height in all the reforestation plots. The lumbang is 30 centimeters in height and the bagilumbang 35 centimeters in height two months after sprouting. The last two named species are all in the nurseries.

Due to interest taken by the local people in guarding their own plantings, there has been no destruction in any of the plantations. The coöperation of the municipal officials in the fifteen towns above-mentioned is most encouraging, as they were always ready to render help and took considerable pains to explain to the people of their municipalities the purpose of this work and the good effects that would result from the planting. The Bureau has put on a forest guard to patrol these various plots and to keep the Bureau informed as to their condition, while at the same time his presence on the ground helps to keep

up the interest already established. One of the nurseries is established on private ground, the use of which was given by Mr. Saturnino Bello, while the other nursery is established on public land. In the nurseries, narra and algarroba (*Ceratonia siliqua*) have been planted for distribution, but the main species are, as stated above, lumbang and bagilumbang. Nurserymen are employed for the care of these two nurseries.

Other municipalities have requested the coöperation of this Bureau and it is hoped that during the coming year the work can be extended to them also. In Zambales Province the work has not been taken up in as detailed a manner as in the Ilocos provinces, but during the coming year more work will be done there insofar as getting coöperation of the municipalities is concerned. Five municipalities in this province have already been taken care of. It is hoped that during next year considerable teak will be planted in Zambales and that enough teak seeds will be available for trials in both of the Ilocos provinces.

ARAYAT REFORESTATION

This project was started in 1914. Due partly to lack of money and men, but principally because of the fact that this project was to be included in a forest reserve and the land question had not been settled, it was not given much attention from a reforestation standpoint. The principal end sought in this project was to provide firewood for the vicinity, inasmuch as the demand for firewood by the sugar mills is very great; one town alone has 64 small mills consuming firewood. As a result of the former activity, approximately 50 hectares are now planted to ipil-ipil. This planting was in patches in the small caiñgins. Over 100 hectares in caiñgins are still to be planted, and the Bureau hopes to effect this during the coming year. Very little coöperation was received from the municipal officials, particularly of Arayat, Pampanga, where during the last election the President issued permits for the cutting of firewood and the making of caiñgins totally without authority from the Bureau of Forestry. Most of the caiñgin-makers were induced to broadcast ipil-ipil seeds in this project during the past year, yet it was found that practically no results were obtained from this work. It is hoped that, should the Arayat Reserve be proclaimed as outlined in last year's report, effective work may be started.

CEBU REFORESTATION

Considerable additions were made to the nursery as far as new species for trial were concerned, but very little work was done

during 1919, due to lack of funds, as will be seen from the following comparative table:

Year.	Area under Bureau of Forestry.	Area handled.		Area of kogonal planted.		Area caiñgin planted.		Amount of Ipil-ipil seeds broadcasted.
	Ha.	*Ha.*	*Per cent.*	*Ha.*	*Per cent.*	*Ha.*	*Per cent.*	*Liters.*
1916	Ap. 4,095	666	16.26	352	8.59	52.0	1.27	9,342
1917		971	23.61	854	20.60	67.3	1.65	20,640
1918		1,360	33.24	220	5.41	318.7	7.78	5,280
1919		1.15	.02			1.15	.02	
Total	4,095	2,998.15	73.13	1,426	34.6	439.15	10.72	35,262

Year.	Number of—				Distance boundary.		Distance horse trail constructed.	Distance of foot trail constructed.
	Ipil-ipil seedlings planted.	Lumbang seeds sown.	Bagilum bang sown.	Seedlings set out.	Cleaned.	Planted.		
					Km.	*Km.*	*Km.*	*Km.*
1916	104,841	56,920	163,930		17.2	14.1	.915	3.114
1917	10,628	50,000	245,170	4,136	6.3	6.3	None.	None.
1918	None.	18,000	393,450	7,791	None.	None.	None.	None.
1919	None.	None.	None.	2,880	None.	None.	None.	None.
Total	115,469	124,920	802,550	14,807	23.5	20.4	.915	3.114

Special licenses were issued for the cutting on this project of ipil-ipil for firewood and charcoal, the income from which is turned over to the Bureau of Lands, inasmuch as this land is a part of the Friar lands Estate turned over to the Bureau of Forestry for administration. The following table gives the number of licenses with the amounts requested, purpose for which granted, and the amounts invoiced:

Number of license.	Amount of license.	Product granted.	Amount invoiced.
	Cu. m.		*Cu. m.*
63	100	Firewood	60
64	100	do	45
65	100	Charcoal	27½
66	100	do	13½
67	30	do	
68	50	do	
69	70	Firewood	2½
70	50	Charcoal	21½
71	50	do	34½
73	Not in file	Firewood	45
76	750	do	145
77	40	do	

Total amount gathered.....393⅚ cubic meters.

It is gratifying to know that, after four years, over 393 cubic meters of firewood and charcoal were taken off the area in thinnings from ipil-ipil alone. No serious damage was done in the plantations during the past year and in general the attitude of the people toward this project seems to be much better than in the past, since they have been made to understand what the purpose of this work is, with the result that they now have a better understanding of the law. It is hoped that during the

coming year, money will be made available for considerable purchases of seeds and for labor to continue this work.

BAGUIO REFORESTATION

The trials with wild pine seedlings during the past year have given very poor results, which was undoubtedly due to the lack of water during the long dry season of last year. Frequent inspections of the Antamok River Plantation have shown that some 50 per cent of the plants are doing well, with some already flowering, in spite of the fact that cattle are pasturing over the area. Some 360 plants, principally camphor, have been taken to the Trinidad Farm School for reforestation work, and the undersigned wishes to call attention to the public spirit and enthusiastic coöperation of the School Principal, Mr. J. A. Wright, in this work. The Bureau coöperated with the military commander of Camp John Hay, in the planting of the hillside around the hydro-electric plant, where some 60,000 cuttings were set out, the principal object being to prevent slides and erosion. The growth records have been carried on with the local pine, and there are now available continuous records for three years. This work will be continued for at least ten years, or even longer, in order to have reliable data available. Other growth observation plots were located at various points of the forest in and around Baguio.

DIVISION OF SAWMILLS AND UTILIZATION

PERSONNEL

During the past year, one lumber inspector and five rangers assigned to this division have been separated from the Bureau by resignation or dismissal. However, all the members of the new class from the Forest School entering the Bureau this year having received training in scaling work, five of them have been assigned to scaling stations, while the others can be called on, as occasion demands, to perform this class of work.

The plan of training a corps of guard scalers to carry on the actual scaling work under the direction of competent rangers has been continued during the year with the result that the Bureau now has some twelve men of this class stationed at the different mills. Certain guards regularly assigned to other classes of work have had some preliminary training in scaling work, and this makes them available for appointment as guard-scalers, after a short additional training, whenever positions may occur requiring their services.

While in the future thorough training in scaling work will form a regular part of the instruction of rangers studying at

the Forest School, the demand for their services in other lines of duty in this Bureau makes it extremely essential that the policy of training guard-scalers for the regular routine work be continued. Accordingly, it is of the highest importance that a sufficient appropriation be provided for giving appointment to these men for duty wherever the quantity of timber cut, (especially by sawmill owners), would require a disproportionate amount of attention from the local rangers.

SCALING

Scaling work at those mills where rangers and guards are regularly stationed (Class C mills) has been generally satisfactory during the year, appreciable difficulties having been encountered at but two mills. These complaints were personally investigated by the chief of this division and by the supervising scaler with the result that in the first case, the complaint of improper identification of species and insufficient deduction for defects, the trouble was found to be largely in a misunderstanding of the mill manager as to the Government system of scaling and lack of familiarity with the species on the part of some of the company's tallymen.

The second complaint arose over the interference with the operations of the logging and transportation work by the time required and place designated for scaling. This case was investigated and trials made at different points to determine the most suitable point which would be satisfactory to both the company and this Bureau.

For scaling at the smaller mills, at which formerly no permanent scaler could be stationed, the work has been greatly improved through the increase in the guard-scaler force, permitting the rangers to make more frequent inspection trips during which they could visit these mills. Moreover, the transfer of rangers trained in scaling work to stations having small mills under their direction, but where formerly none of the rangers were familiar with the work, has helped to improve our supervision of these mills.

LUMBER GRADING

Further work in the training of lumber graders had to be suspended during the past year owing to the demand for utilizing the men for more pressing work and to the resignation of the lumber inspector formerly employed by this Bureau.

The importance of this work (as noted in the annual report of this Bureau for 1917) can not be too greatly stressed, for the interest of all concerned; (1) of the lumberman, on account of the prices he can command for property graded lumber; (2) of

the purchaser, through assurance of securing the grade of lumber suitable to his needs; and (3) of the Government, through the better name which such a system is bound to bring to the lumber produced in the Philippines.

At present, almost the only attention paid to grading work by the sawmill companies is that given by a few of the larger companies shipping special stock to foreign markets, or in making up special orders. However, the general attention of all lumber manufacturers and dealers, so necessary to realize the full benefit of this class of work, has not yet been secured; and while the hearty coöperation of lumbermen is essential to the adoption of grading work, it naturally falls on the Bureau of Forestry to do the necessary preliminary work in training a corps of men capable of handling this class of work and demonstrating its full value.

During the past year, several requests have been received and handled, both through the office of the wood expert and the Division of Sawmills and Utilization, for the inspection of lumber shipments. While it is true that these inspections were a start in the right direction, they were made mainly with a view to avoiding shipment of cull lumber which would have had to be thrown out by the purchaser on receipt of the shipment. Moreover, this work was not based on any established rules such as are followed in the United States and other countries, the early adoption of which in this country is greatly to be desired.

Three of the first group of rangers instructed in grading work who have had considerable experience in actual practice have left the Bureau, either temporarily for further study in the United States, or permanently, and the official lumber inspector also has resigned. Nevertheless, the Bureau still has men with more or less training in this work.

UTILIZATION

The efforts on the part of various companies to reduce their waste to a minimum (a matter particularly noted in previous annual reports) have been kept up as much as possible, and some companies have added special units of new machinery for better utilization.

The Insular Lumber Company was forced to close its stave mill for several months, owing to the closing of the Rizal Cement Works and to the overstocking of the China market. However, a new order from Hongkong enabled them to reopen the mill during November. The daily capacity of their present stave mill is from 600 to 800 bundles of 25 staves, or from 4,650 to 6,200 board feet. This material is cut entirely from waste slabs and edgings of the lauans and tangile.

A new source of utilization of waste has been established during the past year by the Oriental Products Company, which concern has established a plant next to the mill of the Negros Philippine Lumber Company where they extract potash from the sawdust and other mill-waste, also from banana and hemp waste. The potash so far extracted has been used in the manufacture of fertilizer, for which the company has had more orders than they have been able to fill.

The Cadwallader-Gibson Lumber Company has during the year added a rotary veneer slicer to their veneer mill, as well as gluing machinery and veneer-ply presses. This company is making numerous experiments with various glues and gluing methods to develop a satisfactory ply-wood from local species. Shipments of sample stock have already been sent to Austrialia and to China, and the Company already has had local orders for plain stock (from the cigar-box and picture-frame trade)—which have necessitated the enlarging of their drying plant.

The manufacture, from otherwise waste material, of short stocks for the United States and China markets is also being continued at this mill, so that the Cadwallader-Gibson Lumber Company secures a very high utilization of their logs.

LUMBERING

Reports from the various mills throughout the Islands show a general increase in lumber production wherever the mills had not previously been running to full capacity, with a resultant increase of 7,000,000 board feet for the period from January 1 to September 30, 1919, as compared with the same peroid in 1918, this increase being in the product of the larger mills from which regular reports are received.

Certain of the mills show some decrease in their production, owing to the fact that time was lost in rebuilding, or in installing new boilers and machinery. The production reports for the periods above mentioned show a total mill tally of fifty-nine and one-half million board feet for 1919, as compared with fifty-two and one-half million board feet for the same period of 1918.

Additions to and improvements of plants are being made by a large number of the lumber companies, while applications for timber licenses from new companies are coming in regularly—all indicating general confidence in a continuation of the present active market, not to mention the apparent expectation of an increasing demand.

Newly formed companies which have been granted long term agreements, either on new areas or for areas abandoned on account of the hard times during the early part of the European

war, are: The Zambales Lumber Company, Ruiz y Rementeria, The Olutanga Lumber Company, and the Gordon-Schilling Company; while inquiries and applications have been received for areas in Apayao, Laguna, Tayabas, Mindoro, Samar, Agusan, Zamboanga, and Cotabato.

The Cadwallader-Gibson Lumber Company have at this writing almost completed a new and up-to-date band mill with necessary logging railroad and equipment, on the side of their concession opposite to the site of their present operations and expect to start work there in January, 1920.

Their veneer mill, which is the only one in the Philippines, has been enlarged and improved with a view to handling the increased business which the company is developing in plain veneers and ply-stock.

The Insular Lumber Company, after having taken out its old circular rig, is rebuilding this mill and in it is installing an eight foot band rig, with the intention of increasing the daily output to 100,000 board feet.

They also have done some work in cutting out reverse grades on the railroad and are planning to purchase a heavier type of locomotive and rolling stock to handle the logging work, which has been extended considerably further into the interior of the concession area.

The Negros-Philippine Lumber Company has enlarged and improved the sorting table at the rear of the mill and has installed a 6-foot Mershon roller-band resaw for cutting up cants, which should materially increase their output. They have added a second Shay locomotive—42 tons—on their railroad and are waiting for the arrival of wheels and axles to increase the number of log cars on their railroad. A new logging superintendent has been put in charge, who already has overcome the shortage of log supply at the mill from which the company had suffered since the loss of their former superintendent.

The Kolambugan Lumber and Development Company has, since the arrival of its new manager, doubled its daily output, though still greatly hampered in the increase of its total production through delays in getting new logging equipment from the United States. However, the greater part of this material has now been received, and the operations are going ahead rapidly.

The president of the Mindanao Lumber Company has spent a large amount of time personally supervising the work at Naga-Naga, with the result that the company is now preparing to act on the recommendations of several forest officers that the company install a logging railroad. The president is now

looking for men to cruise the company's concession and to survey its railroad line.

The same company owns the Calauag Sawmill and has invested therein extensive improvements and additions to the mill and the logging equipment, which should develop this into an efficient operation during the coming year.

The Port Banga Lumber Company has brought out from the United States a new set of boilers to replace the old ones which were no longer able to supply sufficient power, and the company is rebuilding and improving the arrangement of its mill.

During the past year, the Basilan Lumber Company built, on Maluso Bay, a new mill which started operating about the first of November, and the company is installing a tram line with which to supply logs to its mill.

Various improvements or additions have either been made or prepared for by the Olutanga Lumber Company, Port Lebak Lumber Company, Misamis Sawing Lumber Company and the Catabañgan Sawmill, while the Zambales Lumber Company has installed and started up a temporary circular mill pending the arrival of machinery from the United States for a large band mill and logging equipment. The old Taba Sawmill at Lumarao, Zamboanga, has been purchased from the Bank of the Philippine Islands and will be put in running order within the next few months.

The old Sibuyan Sawmill, which was sold last year, has been moved to and set up on a piece of private forest about four miles from Cadiz, Negros Occidental.

The following table shows a comparative statement of total log scale, trimmer tally and forest charges for the first nine months of 1918 and 1919 from the twelve larger mills operating during these two periods. The figures for these mills give a close indication of the general activity of licensees throughout the Islands.

Totals of the scale, mill tally and charges for 12 sawmills from January 1 to September 30.

Year.	Scale.	Mill tally.	Forest charges.
	Cu. m.	*Cu. m.*	
1919	199,303.11	140,254.66	₱164,024.06
1918	177,699.85	123,932.63	156 875.13

LOCAL MARKETS

The following tables made up from reports received from the ten larger and more regular operators show a comparison of the amounts of lumber shipped to various local ports and to foreign

ports from January 1 to September 30, 1918 and 1919 and for the entire year 1918.

Lumber shipments from January 1 to September 30, 1918, from principal Class B and C sawmills.

Destination.	Red and white Lauan.	Tangile.	Apitong.	Guijo.	Yakal.
Foreign ports	322,976	906,992			
Manila	9,227,000	629,744	5,230,967	892,073	986,639
Cebu	243,255	22,846	220,315	127,360	101,153
Iloilo	703,319		53,612		
Zamboanga	273,136		128,208	103,191	97,711
Davao	349,113		18,805	38,931	25,524
Mindanao and Sulu	131,637	13,128	27,473	14,888	8,830
Luzon ports	14,717	11,111	38,359	4,586	1,187
Visayan ports	182,565		2,793		
Unclassified ports	12,004,408	771,587	1,411,461	54,810	7,893
Total	23,452,126	2,355,408	7,131.993	1,235,839	1,228,937

Destination.	Lumbayau.	Palosapis.	Miscellaneous.	Total.
Foreign ports				1,229,968
Manila	618,166	1,933,363	2,151,342	21,669,284
Cebu	320,853		229,138	1,264,920
Iloilo			150,751	907,682
Zamboanga	367,814		153,034	1,123,094
Davao	1,676		211,859	645,908
Mindanao and Sulu	2,518		184,649	383,123
Luzon ports		573	12,965	83,498
Visayan ports			657,336	842,694
Unclassified ports	123,686		1,075,388	15,449,233
Total	1,434,713	1,933,936	4,826,462	43,599,404

Lumber shipments from Jan. 1, to Dec. 31, 1918.

Destination.	Red and white Lauan.	Tangile.	Apitong.	Guijo.	Yakal.
Foreign ports	322,976	1,089,314			
Manila	11,598,489	1,166,034	6,502,318	1,004,793	1,165,025
Cebu	594,493	22,846	400,778	150,534	134,816
Iloilo	952,187		112,885		
Zamboanga	642,130	1,345	191,260	196,357	174,431
Davao	425,939		112,018	63,506	25,524
Mindanao and Sulu	166,250	13,275	31,696	15,098	9,356
Luzon ports	14,717	11,412	45,868	4,624	1,225
Visayan ports	214,412		3,540		
Unclassified ports	18,687,527	1,121,027	2,253,422	65,269	10,938
Total	33,619,120	3,425,253	9,653,785	1,500,181	1,521,315

Destination.	Lumbayau.	Palosapis.	Miscellaneous.	Total.
Foreign ports				1,412,290
Manila	903,156	2,182,487	2,505,001	27,027,303
Cebu	431,218		251,203	1,985,888
Iloilo			150,751	1,215,823
Zamboanga	468,758		203,379	1,877,660
Davao	49,156		254,191	930,334
Mindanao and Sulu	7,333		271,732	514,740
Luzon ports		573	12,990	91,409
Visayan ports			1,179,983	1,397,935
Unclassified ports	137,531		1,086,060	23,361,774
Total	1,997,152	2,183,060	5,915,290	59,815,156

Lumber shipments from January 1 to September 30, 1919, from principal Class B and C sawmills.

Destination.	Red Lauan and Tangile.	White Lauan.	Apitong.	Guijo.	Manggachapui.
Foreign ports	1,701,187	1,731,772	38,746		
Manila	1,937,142	9,531,411	4,609,162	1,500,493	376,142
Luzon ports	2,451	1,650	109,656	1,907	
Cebu	550,070	1,321,185	759,367	140,713	43,880
Iloilo	196,352	545,369	102,477		
Visayan ports	860,927	139,484	21,648	4,872	
Zamboanga	22,436	519,002	203,831	143,754	37,550
Davao	1,395	170,624	37,667	55,049	23,069
Mindanao and Sulu ports	98,823	1,234,103	502,174	116,000	14,986
Unclassified ports	5,978,614	6,777,665	1,512,489		
Total	11,349,397	21,972,265	7,897,217	1,962,788	495,627

Destination.	Yakal.	Lumbayau.	Palosapis.	Miscellaneous.	Total.
Foreign ports				41,438	3,513,143
Manila	1,061,675	948,816	572,034	1,652,786	22,189,661
Luzon ports	2,196		475	58,736	177,071
Cebu	158,506	173,460		194,661	3,341,842
Iloilo					844,198
Visayan ports	40,080	15,958		2,583,385	3,666,354
Zamboanga	160,621	435,216		90,232	1,612,642
Davao	50,668	70,083		120,971	529,526
Mindanao and Sulu ports	91,936	276,163		34,674	2,368,859
Unclassified ports					14,268,768
Total	1,565,682	1,919,696	572,509	4,776,883	52,512,064

NOTE.—The above figures are in board feet.

The shipments listed under "Unclassified Ports" were made up almost entirely of the shipments from mills which failed to furnish complete data as to destination of shipments. The major portion of these unclassified shipments were sent to Manila, the remainder going to various local ports in the Visayan Islands, such as Cebu, Iloilo, Bantayan, San Carlos, Bacolod, etc.

The increase in shipments during the past year is indicated by the fact that including the month of October, 1919, the shipments for only the first 10 months of 1919 are 59,737,876 board feet as compared with 59,815,163 for the entire year of 1918. With a maintenance of average monthly shipments from these 10 mills during November and December, the increased shipment of lumber for 1919 will be 100 million board feet, as compared with an estimated total in 1918, from all mills, of 75 million board feet.

Building activities all over the Islands, augmented by the building of new sugar centrals in the Visayas and in Luzon, the development of the coal mines in Mindanao and Cebu, the development of agricultural lands in Mindanao and the general demands of business and housing needs, have greatly increased the call for lumber and made a very favorable year for all lumber producers and dealers.

There is a certain amount of uneasiness expressed among some

of the lumbermen that, with the placing of more ships on the Pacific and an expected decrease in freight rates, Oregon Pine will again come into competition with local woods (as it was before the war), at prices which they can not successfully meet. However, the demands which will be made on American timber by the home and European markets, together with the improbability of lumber prices in the United States returning to prewar levels, will doubtless tend to prevent any such serious competition. The investments in machinery for and the development of Philippine lumbering operations already noted in this report indicate that the foregoing is the general feeling among lumbermen in the Islands.

FOREIGN MARKETS

The following table shows the exports of lumber and timber by species from January to September, 1918 and 1919, as reported from the Bureau of Customs. (The exports by countries are not published in monthly statements, but are secured from the Collector of Customs at the close of each year.)

Lumber exports to all countries from January 1 to September 30.

Species.	1919		1918	
	Amount.	Value.	Amount.	Value.
	Cu. m.		*Cu. m.*	
Almon	272	₱8,667	1,642	₱46,997
Apitong	225	12,663	1,806	73,254
Guijo	3	464	12	750
Kalantas	62	3,890		
Ipil	10	2,410	7	909
Lauan	7,530	319,540	2,029	78,762
Molave	1	47	35	5,500
Narra	(?)	150	2	250
Tangile	2,404	166,024	2,310	157,870
Tindalo	1	145	(?)	65
Yakal	4	360	(?)	9
Camagon	5	900	3	114
Manggasinoro	68	2,029		
Tamil	13	378		
Palosapis			443	16,213
Lumbayau			1	41
Other Lumber	6	1,023	1,564	57,898
Nato	17	494	1	163
Total	10,621 [a]4,503,304	519,184	9,855 [a]4,178,520	438,795

[a] Board feet.

Timber exports.

Camagon	18	1,300		
Apitong	42	5,000		
Ipil	1	50	117	9,525
Tangile			31	1,015
Teak	2	300		
Tindalo	1	150		
Total	64 [a]27,136	6,800	148 [a]62,752	10,540

[a] Board feet.

The largest amount of these shipment goes to the United States, with comparatively large shipments to Hongkong and Shanghai, and smaller amounts to Japan, Indo-China, Australia, etc.

Considerable interest has developed in the China market during the past year, several of the lumber companies having sent representatives to investigate market conditions there.

Moreover, a letter was received by this Bureau from Shanghai presenting a short statement of the conditions of the lumber market there and requesting the coöperation of the Bureau of Forestry and Philippine lumbermen in establishing a regular and dependable supply of Philippine lumber. This was taken up with a number of Philippine lumbermen, and a former Chinese student from the Forest School, who had shown unusual ability in the study of logging, milling and marketing work, and who had become well acquainted with the conditions of the Philippine market, was sent to Shanghai to acquaint the Chinese dealers with Philippine timber supply and the market conditions.

While the amount of the bottoms available and the resultant cost of freight have been detrimental to the full development of the China market for Philippine lumber, the interest, so far, of local lumbermen in coöperating with each other in developing that market, has been disappointing.

The great tendency seems to be to want to enter the China market independently, and to make an attempt to "corner" it by making all other companies deal through that one which might first succeed in firmly establishing itself there; and it seems doubtful whether exactly this can be done—not to mention the delay which such a procedure involves for getting Philippine lumber on a solid basis in the China market.

During the year, an Australian lumber dealer visited the Philippine Islands with the object of investigating available supplies of timber and establishing connections.

With such markets available and the world-wide demand there will be for lumber for the next five to ten years for reconstruction work following the war, the possibilities for development of the Philippine lumber industry and for foreign sales are most excellent.

LUMBERMEN'S ASSOCIATION.

The attitude of several of the local lumbermen with regard to the above-mentioned letter from the Shanghai lumber dealers

brings up very forcibly the old question of the need for a Philippine Lumbermen's Association. The attempt to organize such a body in 1915 and 1916 had proved a complete failure, owing to the indifference and distrust displayed by the majority of the parties chiefly interested, the lumbermen.

This failure has worked only to disadvantage of the lumber business as a whole in the Islands; and it is therefore very desirable that local lumbermen consider the advantages such organizations in America have brought to manufacturers there, and promptly take steps to overcome their mutual distrust and organize.

Questions of publicity and the development of foreign markets, transportation problems, grading rules, training and appointment of lumber inspectors and all similar matters, could be taken up and settled in a manner which the Bureau of Forestry acting alone could never hope to accomplish. It seems most important for the progress of the lumbering work in this country that anyone who shows a live interest in the matter be aided in any way possible by the Government to revive the idea of organizing a Lumbermen's Association.

DIVISION OF FOREST LANDS AND MAPS.

SECTION OF PUBLIC FOREST LANDS CASES.

The same difficulties encountered in former years have likewise been observed in handling the cases pertaining to the section of public forest lands.

However, one of the difficulties, originating in the interpretation of the Philippine Supreme Court in some of its decisions to the effect that mangrove swamps are agricultural lands, has been dispelled by the last decision handed down by the Supreme Court in the case of J. H. Ankron *vs.* the Government of the Philippine Islands (Official Gazette, Vol. XVII, No. 43, October 22, 1919). In this decision the Court declared that "Whether the particular land is agricultural, forestry, or mineral, is a question to be settled in each particular case, unless the Bureau of Forestry has, under the authority conferred upon it, prior to the intervention of private interests, set aside for forestry or mineral purposes the particular land in question.

"The mere fact that land is a mangrove swamp *is not sufficient in itself* to show that it is agricultural, forestry, or mineral. It may belong to one or the other class."

The following table shows the status of the claims received during 1919:

	Number received.	Action.	No action necessary after inspection.	Pending decision.	Number of hectares adjudicated to the Insular Government.
Cadastral	12	8		8	
Ordinary	1,297	134	83	44	154.55
Total	1,309	142	83	52	154.55

SECTION OF PRIVATE FOREST LANDS REGISTRY.

One hundred and ten parcels of land with a total area of 14,943 hectares, 71 ares, and 39 centares have been registered in accordance with the provisions of section 1829 of the Administrative Code, and examined for the information of the Collector of Internal Revenue.

The greater part of the work in this section during the year consisted in preparing the correspondence which required the many claimants of public forest lands to submit their titles for registration in this Bureau; this, because of conflicts and friction between licensees of the Bureau of Forestry and the claimants.

In most cases, no answer to these letters were received from the claimants, and only after making great effort and bringing considerable pressure to bear on the interested parties, was it found that such claims were based either on a private document showing that the rights of a caiñgin maker who abandoned the land had been purchased, or on a mere land-tax declaration, made one or two years previous and covering extensive forest areas. Meanwhile, under such circumstances, the utilization of forest products is necessarily suspended, causing not only a decrease in forest revenues, but also a loss to the licensee in the stoppage of his business during the investigation.

In order as much as possible to obviate these deficiencies and to be able to settle such cases as might arise, suitable legislation was recommended last year which would authorize the Director of Forestry, after making an examination of the land and a careful study of the proofs presented, to settle the questions of fact, which settlement, once approved by the Department Secretary, shall be final so long as the Court of Land Registration, on request by the claimant, might not decide the question. But as no action has been taken regarding this legislation so greatly

needed, it is now again recommended, since it is greatly to be desired in the interest of efficient administration.

The following table shows the private woodlands registered up to December 31, 1919:

Registered private woodlands.

Calendar year.	Number of—			
	Parcels.	Hectares.	Ares.	Centares.
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,215	86	62
1910	4	8,653	85	22
1911	5	5,533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
1917	48	7,985	68	39
1918	84	43,213	17	26
1919	110	14,943	71	39.24
Total	1,100	380,745	83	98.24

SECTION OF PUBLIC LANDS APPLICATION

The imperative necessity of organizing a large party for the purpose of making a forest reconnaissance of Davao Province, in which all the new graduates from the Forest School at Los Baños took part, under the supervision of old rangers called from the different stations, caused a decrease in the personnel of those stations for field work, with a resultant falling off in public land application examinations. The importance of this work may be seen from the summary given below. This summary is taken from the table showing the distribution of applications for public lands in the different provinces of the Archipelago.

Summary of Table I, Appendix.

Applications on hand during 1919		11,863
Certified for agriculture	5,824	
Certified for forestry	863	7,040
Returned uncertified	353	
Total pending December 31, 1919		4,823

About 46 per cent of the 4,823 pending applications have been examined, but the reports and recommendations of the district officers are pending either because of lack of clerical help or the lack of time to do the work themselves. Furthermore, at the

direct requests of applicants who were helped by forest officers in making their applications, 913 parcels of public land have been examined, the certificates of which are ready for issuance as soon as requested by the Director of Lands.

In view of the fact that the new Public Land Act, which changes the procedure of acquiring lands of the public domain, took effect on November 29, 1919, the established method of making examination of lands for certification to the Director of Lands is necessarily affected. Up to the present time, said examination is made, in each individual case, upon request of the applicant, thus compelling the Bureau of Forestry to devote an undue part of its personnel, time and money to his work.

During the past three years the Bureau of Forestry intended to carry out a policy, in connection with the study and location of forest zones and reserves, of examining and certifying large areas for agricultural uses. The lack of personnel, hardly sufficient even for the routine work in forest administration, prevented the carrying out of this project. The new law will necessitate the selection and training of a body of rangers especially for this purpose.

Act 2874 only refers to the intervention of the Bureau of Forestry in cases of leases of public lands (sec. 38) but it is to be expected that on making the recommendation to the Governor-General, as provided in section 6, the Secretary of Agriculture and Natural Resources will order the Bureau of Forestry to demarcate the alienable or disposable zones and likewise the forest zones, according to sections 1827 and 1828 of the Administrative Code.

The demarcation of these zones in each region of the Archipelago is very important for the proper conservation and utilization of large forest resources and their future development and for the setting aside of lands which are really fitted for permanent agricultural uses.

Those forest areas which for one reason or another it is not necessary to keep as such will be certified *en bloc* as alienable lands, so that the Director of Lands may dispose of them in the most convenient way for their proper entry.

The new plan of making the examination and certification of large areas of public lands will indirectly help in solving the important problem of Philippine intermigration. There are regions with dense population where the lack of agricultural lands prevents the extension of agricultural activities and where the destruction of forest wealth is considerable; while other regions with rich agricultural soil, where the forest stand is of very little value and not necessary for conservation purposes,

cannot be properly developed because of the present dearth of population.

SECTION OF FOREST ZONES, RESERVES AND COMMUNAL FORESTS

Lamao Forest Reserve.—This reserve was proclaimed on July 26, 1904, by Executive Order No. 33 of that year with the double purpose of making silvicultural studies and experiments and for the establishment of the Forest School. Inasmuch as this latter project was not carried out in this reserve and the silvicultural experiments are only made in the wooded part, it was believed unnecessary to preserve the agricultural portion of the same, and for this reason it was recommended that 890 hectares (the boundaries of which are described in proclamation No. 26 of July 1, 1918) be reverted to public use, and that 621 hectares as a reserve for a horticultural station, in accordance with Executive Order No. 48 of July 12, 1919, be transferred to the Bureau of Agriculture.

Kolambugan Forest Reserve.—Under Executive Order No. 85 of November 12, 1919, the Forest Station Reserve in the concession of the Kolambugan Lumber Co., Barrio Maribojoc, Municipal District of Kolambugan, Province of Lanao, Mindanao Island, was established.

The lack of field personnel and the pressure of other important work prevented the filing of requests for the proclamation of other reserves which are of great importance for conservation ends.

Communal Forests.—In accordance with the provisions of the law, 63 parcels with a total area of 10,537 hectares have been located, studied, and designated as communal forests.

The following tables show the total number of communal forests established up to December 31, 1919, and their distribution by provinces:

Communal Forest established from 1908 to 1919.

Year.	Parcels.	Hectares.
1908	19	5,326.00
1909	19	6,609.00
1910	19	5,796.00
1911	53	15,147.60
1912	59	10,957.00
1913	26	3,387.00
1914	45	6,860.00
1915	90	12,129.00
1916	110	15,862.00
1917	83	10,110.00
1918	61	7,704.82
1919	63	10,537.35
Total	647	110,445.77

Settlement of communal forests established up to December 1919.

Province.	Parcels established.		Total parcels established up to 1919.	Municipalities, rancherias or townships.			Cancelled.	
	Before 1919.	During 1919.		With C. F.	Without C. F.	Area in hectares of parcels established up to 1919.	Parcels.	Hectares.
Abra	21	5	26	14	24	5,472.00		
Albay-Catanduanes	11	1	12	9	13	1,569.00		
Camarines Norte	7	1	8	7	2	1,171.00		
Camarines Sur	28	4	32	22	9	3,877.00		
Antique	4	0	4	3	10	934.00		
Bataan	14	1	15	12	0	4,713.00	2	464.00
Batanes	0	0	0	0	6			
Batangas	1	1	2	1	23	136.00		
Bohol	23	8	31	21	15	3,619.85		
Bulacan	1	1	2	2	22	340.16	1	232.16
Cagayan	33	1	34	18	5	3,559.60		
Capiz	27	0	27	15	10	3,167.00		
Cavite	0	0	0	0	20			
Cebu	10	0	10	7	43	1,175.00		
Ilocos Norte	20	0	20	14	16	6,685.00	4	1,127.00
Ilocos Sur	20	1	21	18	18	7,275.00		
Iloilo	10	0	10	5	25	1,501.00		
Isabela	16	2	18	11	15	2,596.00	1	106.00
Laguna	12	0	12	10	18	1,352.00		
La Union	10	0	10	10	4	3,016.00		
Leyte	30	5	35	18	28	3,719.68		
Mindoro	0	2	2	2	14	584.00		
Misamis	17	3	20	12	38	3,351.00	2	520.00
Mindanao-Sulu:								
Agusan	1	0	1	1	59	160.00		
Bukidnon	1	0	1	1	12	620.00		
Cotabato	0	0	0	0	30			
Davao	0	2	2	1	14	164.00		
Lanao	2	0	2	2	36	800.00		
Sulu	0	0	0	0	27			
Zamboanga	3	0	3	2	75	295.00		
Mountain Province:								
Amburayan	5	1	6	5	4	1,754.00		
Apayao	0	0	0	0	1			
Benguet	1	0	1	1	13	100.00		
Bontoc	0	0	0	0	2			
Ifugao	0	0	0	0	1			
Kalinga	0	0	0	0	1			
Lepanto	1	1	2	1	10	1,225.00		
Negros Occidental	31	1	32	14	11	3,633.00	1	240.00
Negros Oriental	15	1	16	13	84	1,596.00		
Nueva Ecija	22	1	23	21	39	4,954.00		
Nueva Vizcaya	1	1	2	1	18	256.00		
Palawan	0	0	0	0	15			
Pampanga	3	0	3	3	18	395.00		
Pangasinan	31	7	38	26	38	10,887.48		
Rizal	5	1	6	21	4	901.00		
Romblon	6	0	6	4	4	485.00		
Samar	44	3	47	31	14	7,878.00		
Sorsogon-Masbate	16	2	18	12	12	1,807.00		
Surigao	13	0	13	7	7	2,236.00		
Tarlac	10	0	10	7	9	1,849.00	1	265.00
Tayabas-Marinduque	46	3	49	26	6	5,567.00		
Zambales	15	0	15	12	1	3,070.00		
Total	587	60	647	443	943	110,445.77	12	2,954.16

	Parcels.	Hectares.
Total number of parcels and hectares established from 1908 to 1919	647	110,445.77
Total number of parcels and hectares cancelled in various years	12	2,954.16
Balance in force	635	107,491.61

MAPPING AND DRAFTING SECTION

For administrative purposes, there has been completed a new map of Luzon and Mindoro, with the adjacent islands, on a scale of 1:400,000, and considerable progress has been made in the

preparation of a map of the Visayan Islands and Mindanao on the same scale. These maps contain all the latest data secured from the Bureaus of Coast and Geodetic Surveys, Lands, Public Works, and other sources, to which there have been added the topographical and forest data secured by this Bureau. The topographical and forest data taken in connection with the forest reconnaissance of Davao have also been compiled and there has been prepared a special map on the scale of 1:200,000 for the report of said reconnaissance.

Topographical and Forest Notes taken during 1919.

District No.	Received.	Pending.	Total.	Forest valuation.
	Kilometers.	*Kilometers.*	*Kilometers.*	*Hectares.*
1	1,712.01	617.55	2,329.56	24.43
2	171.14	90.10	261.24	24.80
3	2.80	28.86	31.66	
4	309.69	124.61	434.30	285.00
5	669.24	456.82	1,126.06	15.97
6	164.79	335.51	500.30	.83
7	366.58	78.92	445.50	22.00
8	636.60	120.35	756.95	1,221.11
9	281.58	27.93	309.51	5.00
10	289.70	31.58	321.28	2.10
11	309.43	115.49	424.92	11.52
12	76.21	83.67	159.88	16.70
13	311.98	193.96	505.94	14.86
Total	5,301.75	2,305.35	7,607.10	1,644.32

Considerable graphical information has been added to the forest progressive sheets on the scales of 1:100,000 and 1:200,000. In addition, tracings were made from different original plans for communal forests, maps of private lands for registration, models, etc. Three thousand nine hundred and twenty-five (3,925) copies of blue prints were prepared for the public in general and for official purposes.

SECTION OF FOREST RECONNAISSANCE

In view of numerous lease and purchase applications for large areas of public lands in a region where communication is difficult, and which has never been studied, (being almost unknown and regarding which no reliable information was at hand), a party was organized consisting of three forest supervisors, 30 rangers and 30 forest guards. This party, under the supervision of the Chief, Division of Forest Lands and Maps, proceeded from Manila to Davao to carry out, during the months of February to July, the forest reconnaissance of that province.

The discovery, during the course of this reconnaissance, that great areas of commercial forest had been devastated by various corporations which had made applications for public lands, made it necessary to draw away several parties from the work of the

reconnaissance to investigate the causes of such destruction, and to measure and assess the value of the timber destroyed.

The liberality and venality of a former forest ranger in Davao caused the Bureau considerable trouble and has created a very bad impression. His reports, embodying recommendations for agricultural purposes, were falsified in many cases, as they covered forest lands of great commercial value. In some cases he granted permits for the destruction of forest upon the mere declaration of the applicants of their intention to lease or purchase a tract of land before approval was had from the head office. This was taken by the companies and corporations as sufficient ground to commence destruction and cultivation either with or without legal permit.

The destroyed timber, which was measured and assessed, amounted to 248,781.18 cubic meters, representing a total of forest charges and surcharges of ₱309,667.03, out of which only ₱73,094.48, corresponding to the destructions which were completely illegal, have been presented for collection by the agents of the Bureau of Internal Revenue.

The results of this forest reconnaissance were prepared in a special report including a map on the scale of 1:200,000 and containing valuable information regarding the topography and the forest importance of this region.

From an agricultural standpoint, the Province of Davao is of great importance, especially the Guianga, Lasang, Tuganay, Tagum, Libuganon, Saug, Limbang, and Hijo valleys.

As regards its forests, from a commercial viewpoint these are not of great value, as only the regions of Guianga and between the Davao and Bunauan Rivers can be logged for local consumption with any likelihood of success, but for purposes of conservation and for the benefit of agriculture itself, the extension of the clearings should be prevented, at least in some regions, since the destruction of the forest will affect unfavorably the supply of water necessary for successful agriculture.

ADMINISTRATIVE DIVISION

On January 1, 1919, the stenographer to the Director, who had first-grade standing and had been in the employ of this Bureau for many years and who had a thorough knowledge of its organization, was appointed Chief Clerk. On his promotion to the latter position, his work as cashier and disbursing officer was turned over to the chief of the disbursing and auditing section of this Bureau, while his work as stenographer was entrusted to a stenographer, formerly an employee of this Bureau, who early in the year was given reinstatement.

RECORDS SECTION

The difficulty of securing an efficient record clerk has not been fully remedied during the year, due to the fact that the salary allowed for this position is comparatively small; however, the efficiency of the record section was not allowed to suffer thereby. The record clerk, appointed in the early part of 1919, was separated from the service and his assistant was placed in charge of the section, but due to the increase in the volume of correspondence requiring to be handled in this section, the chief clerk sometimes has to lend his personal assistance in the work.

During the year, upon due authorization, a fire-proof vault was constructed in the north end of the office building of this Bureau in Manila. This is a valuable addition to the building, as it gives this office a place where its valuable records can be preserved. The transfer of as much as possible of our records to this vault has already taken place. The duplicates of the wood specimens of this Bureau will also be stored there.

GENERAL SERVICE SECTION

The chauffeur, messengers, janitors and watchmen come under the administrative section. The work of these employees has been carried on satisfactorily throughout the year both in the messenger service and the maintenance and upkeep of the building and court yard of this Bureau.

DIVISION OF ACCOUNTS AND PROPERTY

This division, as mentioned just above in this report, was created on January 1, 1919, and the former acting chief clerk, who had been the financial employee of this Bureau for several years and who was thoroughly familiar with all the phases of this work, was appointed chief of this division. With the exception of unusual matters requiring the specific approval of the Director, all routine transactions appertaining to accounts and property are handled entirely in this division.

DISBURSING AND AUDITING SECTION

This section is entrusted with the work of the auditing of traveling expenses, and with such other financial duties in the Bureau as salaries, auditing the expense accounts of Bureau employese and all other bookkeeping work in accordance with the Auditor's regulations. The chief of this section, who is also cashier and disbursing officer of this Bureau, is directly responsible to the Chief of the Division of Accounts and Property. During the year, changes in personnel have occurred in this section also, but the work has been carried on without material impairment of efficiency.

PROPERTY SECTION

The work in the property section also has correspondingly increased during the year. A small old warehouse, just south of the Forestry Building, the property of the Insular Government, which was under the care of the city of Manila, was secured for the use of the Bureau. It is being used for storage of supplies and equipment. In this connection, the undersigned wishes to report that, due to the Bureau having a workshop, (which is under the supervision of the wood expert), office furniture, such as office tables, chairs, portable filing cases, etc., were made in this shop, resulting in economy to this Bureau while giving us office furniture built to our satisfaction.

LIBRARY AND TRANSLATING SECTION

The work of this section has increased considerably due to the number of translations necessary from English to Spanish and *vice versa*. It is a noticeable fact, particularly during the past year, that much more correspondence in Spanish has been received, and it might seem that the English language is not being used to the extent that it should.

Numerous new books, catalogs, trade journals, and forestry literature were received and filed, and this section is gradually working out a system whereby information acquired from various papers, etc., can readily be gotten at. The clerk in charge has been assigned as instructor in Spanish in the Forest School in order to give the forestry students a working knowledge of Spanish before entering the Bureau.

RECOMMENDATIONS

The undersinged wishes to reiterate the recommendations made in last year's report, to wit:

That the illegal occupation of public land be punished by law.

That the illegal cutting of forest products be classed as theft and treated as such.

That section 1520 of the Administrative Code be changed to require the payment of forest charges on all forest products cut or gathered, whether removed from the forest or not, before a license expires.

That efficient means for the eradication of water hyacinth be instituted.

That forest guards be forbidden to have any pecuniary interest in forest products.

That the Bureau of Forestry be given positions for qualified surveyors to do the urgent survey work on forest reserves.

That an attorney of the Bureau of Justice be assigned wholly to the legal work of this Bureau.

That provincial fiscals take more interest in forestry cases, especially in the presentation of evidence.

That the authority of the Bureau of Forestry be increased in order to allow it to decide questions of fact relating to claims of public forests without title, once approved by the Department Secretary.

That a permanent corps of forest guards be organized for administrative and patrol work to substitute the rangers' work and also to relieve rangers for land classification in accordance with the new land law.

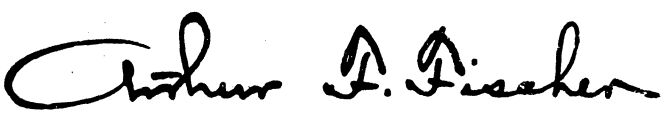
That the penalty provided in section 2751 of the Administrative Code be increased and that forest products destroyed be charged at the present market rate and that the punishment be mandatory.

That the surcharges on forest products illegally cut or gathered be trebled in case of the second offense and, in case of third or successive offense, the forest products be seized outright. This is exceedingly necessary to protect legal forest users, to regulate utilization and to avoid the destruction of valuable species necessary for reproduction.

For the Forest School and the Division of Investigation, additional buildings are necessary as well as additional equipment to adequately give the higher course and carry on investigative work. Additional cottages are necessary for the housing of the students and personnel of the School and of the Division of Investigation.

Personnel.—The Government must take action in allowing an increase in clerical personnel as well as in their salaries, and in providing that the salaries of the technical personnel be placed on the same basis as other scientific branches of the Government, and per diems must be raised or it will be practically impossible for the Bureau to function properly and efficiently.

It is further recommended, that game and fish legislation be made stricter and entrusted to forest officers for administration.



Director of Forestry.

The SECRETARY OF
AGRICULTURE AND NATURAL RESOURCES,
Manila.

STATISTICAL TABLES

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certification made to the same regarding the agricultural or forest value.*

Province.	Received from the Bureau of Lands.									Certification made to the Bureau of Lands.								
	Pending from previous years.				During the year 1919.					Agriculture.				Forestry.				
	A. C.	H.	P.	L.	A. C.	H.	P.	L.	Total.	A. C.	H.	P.	L.	A. C.	H.	P.	L.	Total.
Abra	0	6	2	0	0	13	5	1	27	0	15	6	1	0	2	0	0	24
Agusan	0	84	10	3	0	95	15	7	214	0	103	8	3	0	2	1	2	119
Albay	0	41	6	0	0	199	8	0	254	0	111	3	0	0	25	0	0	139
Ambos Camarines	0	246	14	2	0	282	41	3	588	0	211	16	1	0	68	1	0	297
Antique	0	18	0	0	0	30	2	0	50	0	12	0	0	0	0	0	0	12
Bataan	0	100	18	1	0	79	19	5	222	0	120	21	0	0	3	0	0	144
Batanes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Batangas	0	0	1	0	0	0	6	0	7	0	0	2	0	0	0	0	0	2
Bohol	0	13	1	1	0	25	1	2	43	0	25	0	1	0	0	0	0	26
Bukidnon	0	9	1	1	0	30	2	1	44	0	26	3	1	0	0	0	0	30
Bulacan	0	2	0	0	0	4	0	0	6	0	2	0	0	0	0	0	0	2
Cagayan	0	85	20	0	0	219	32	0	356	0	209	23	0	0	10	0	0	242
Capiz	0	11	2	1	0	10	0	0	24	0	7	1	0	0	0	0	0	8
Cavite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cebu	0	10	2	0	0	22	10	4	48	0	7	3	0	0	9	6	1	26
Cotabato	0	209	3	9	0	525	16	29	791	0	328	8	19	0	2	0	0	357
Davao	0	271	31	88	0	186	35	69	680	0	159	30	58	0	2	1	10	260
Ilocos Norte	0	10	0	0	0	18	4	0	32	0	21	0	0	0	2	0	0	23
Ilocos Sur	0	59	6	1	0	67	12	0	145	0	91	11	1	0	13	4	0	120
Iloilo	0	14	2	0	0	61	8	1	86	0	62	6	0	0	0	0	0	68
Isabela	0	43	1	0	0	228	28	0	300	0	133	18	0	0	6	0	0	157
Laguna	0	28	1	0	0	25	0	0	54	0	31	1	0	0	2	0	0	34
Lanao	0	30	1	1	0	101	10	1	144	0	63	5	0	0	6	0	0	74
La Union	0	21	3	2	0	36	1	1	64	0	23	1	1	0	0	1	0	26
Leyte	0	149	7	2	0	242	13	1	414	0	156	10	1	0	27	1	1	196
Mindoro	0	379	21	3	0	333	41	5	782	0	276	27	0	0	101	4	0	408
Misamis	0	3	0	0	0	23	1	0	27	0	16	0	0	0	2	0	0	18
Mountain	0	27	3	0	0	55	0	1	86	0	45	0	0	0	4	2	0	51
Negros Occidental	0	94	5	3	0	291	9	4	406	0	137	5	0	0	68	3	2	215
Negros Oriental	0	10	2	0	0	29	1	0	42	0	14	1	0	0	7	1	0	23
Nueva Ecija	0	673	47	25	0	846	104	46	1,741	0	996	75	34	0	87	2	4	1,198
Nueva Vizcaya	0	106	6	2	0	109	10	5	238	0	137	6	2	0	1	0	0	146
Palawan	0	93	1	3	0	111	5	2	215	0	138	1	1	0	5	0	1	146
Pampanga	0	12	2	0	0	60	2	1	77	0	21	0	0	0	1	0	0	22
Pangasinan	0	168	18	1	0	205	37	5	434	0	214	38	3	0	10	4	0	269
Rizal	0	14	2	0	0	36	5	2	59	0	39	6	0	0	1	0	1	47

Romblon	0	17	0	0	0	18	4	0	39	0	2	0	0	0	12	0	0	14
Samar	0	12	1	0	0	41	2	0	56	0	15	0	0	0	3	1	0	19
Sorsogon	0	81	10	0	0	152	17	0	260	0	104	14	0	0	39	3	0	160
Sulu	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0
Surigao	0	9	1	0	0	34	1	0	45	0	10	0	0	0	6	0	0	16
Tarlac	0	215	17	2	0	72	10	1	317	0	210	14	2	0	54	0	0	280
Tayabas	0	635	40	1	0	1,014	67	4	1,761	0	618	39	1	0	188	10	0	856
Zambales	0	51	10	11	0	103	12	1	188	0	88	4	3	0	5	1	0	101
Zamboanga	0	124	11	2	0	313	38	6	494	0	261	25	4	0	17	5	0	312
Total	0	4,182	329	165	0	6,344	635	208	11,863	0	5,256	431	137	0	790	51	22	6,687

TABLE No. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certification made to the same regarding the agricultural or forest value*—Continued.

Province.	Returned to the Bureau of Lands uncertified during the year 1919.				Total pending for inspection December 31, 1919.				
	H.	P.	L.	Total.	A. C.	H.	P.	L.	Total.
Abra	0	0	0	0	0	2	1	0	3
Agusan	12	6	0	18	0	62	10	5	77
Albay	0	1	0	1	0	104	10	0	114
Ambos Camarines	13	0	0	13	0	236	38	4	278
Antique	0	0	0	0	0	36	2	0	38
Bataan	12	1	0	13	0	44	15	6	65
Batanes	0	0	0	0	0	0	0	0	0
Batangas	0	0	0	0	0	0	5	0	5
Bohol	0	1	0	1	0	13	1	2	16
Bukidnon	0	0	0	0	0	13	0	1	14
Bulacan	0	0	0	0	0	4	0	0	4
Cagayan	13	2	0	15	0	72	27	0	99
Capiz	0	0	1	1	0	14	1	0	15
Cavite	0	0	0	0	0	0	0	0	0
Cebu	0	0	0	0	0	16	3	3	22
Cotabato	1	1	1	3	0	403	10	18	431
Davao	17	4	24	45	0	279	31	65	375
Ilocos Norte	1	0	0	1	0	4	4	0	8
Ilocos Sur	4	0	0	4	0	18	3	0	21
Iloilo	0	0	0	0	0	13	4	1	18
Isabela	2	1	0	3	0	130	10	0	140
Laguna	5	0	0	5	0	15	0	0	15
Lanao	4	1	0	5	0	58	5	2	65
La Union	1	1	1	3	0	33	1	1	35
Leyte	16	0	1	17	0	192	9	0	201
Mindoro	25	6	0	31	0	310	25	8	343
Misamis	0	1	0	1	0	8	0	0	8
Mountain	1	0	0	1	0	32	1	1	34
Negros Occidental	18	0	0	18	0	162	6	5	173
Negros Oriental	2	0	0	2	0	16	1	0	17
Nueva Ecija	55	1	1	57	0	381	73	32	486
Nueva Vizcaya	5	0	0	5	0	72	10	5	87
Palawan	7	0	2	9	0	54	5	1	60
Pampanga	0	0	0	0	0	50	4	1	55
Pangasinan	6	0	0	6	0	143	13	3	159
Rizal	1	1	0	2	0	9	0	1	10
Romblon	9	0	0	9	0	12	4	0	16
Samar	0	0	0	0	0	35	2	0	37
Sorsogon	3	0	0	3	0	87	10	0	97
Sulu	2	1	0	3	0	0	0	0	0
Surigao	0	1	0	1	0	27	1	0	28

Tarlac	1	0	0	1	0	22	13	1	36
Tayabas	25	2	0	27	0	818	56	4	878
Zambales	9	0	0	9	0	52	17	9	78
Zamboanga	13	5	2	20	0	146	14	2	162
Total	288	37	33	353	0	4,197	445	181	4,823

Fiscal year.	Agricultural colonies.			Homesteads.			Sales.			Leases.			Grand total.
	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	
1905	0	0	0	80	6	86	8	0	8	0	0	0	94
1906	0	0	0	318	16	334	20	1	21	1	0	1	356
1907	0	0	0	881	19	900	23	0	23	12	0	12	935
1908	0	0	0	2,456	51	2,507	49	1	50	26	0	26	2,583
1909	0	0	0	1,523	187	1,710	26	3	29	27	0	27	1,766
1910	0	0	0	1,175	385	1,560	34	5	39	42	2	44	1,643
1911	0	0	0	1,528	221	1,749	46	3	49	30	1	31	1,829
1912	0	0	0	2,609	301	2,910	95	11	106	47	1	48	3,064
1913	0	0	0	2,680	269	2,949	104	30	134	47	1	48	3,131
1913 (July 1 to December 31)	0	0	0	1,653	159	1,812	81	16	97	41	3	44	1,953
1914	0	0	0	4,812	685	5,497	279	36	315	77	1	78	5,890
1915	1,086	28	1,114	5,965	688	6,653	317	52	369	70	1	71	8,207
1916	934	41	975	6,015	670	6,685	227	18	245	55	4	59	7,964
1917	670	0	670	7,632	797	8,429	457	27	484	118	6	124	9,707
1918	41	0	41	5,605	621	6,226	420	33	453	109	16	125	6,845
1919	0	0	0	5,256	790	6,046	431	51	482	137	22	159	6,687
Total	2,731	69	2,800	50,188	5,865	56,053	2,617	287	2,904	839	58	897	62,654

SUMMARY.

Applications on hand during 1919		11,863
Certified for Agriculture	5,824	
Certified for Forestry	863	
Returned uncertified	353	
		7,040
Total pending December 31, 1919		4,823

NOTE.—A. C. = Agricultural Colony of 16 hectares lot. H. = Homestead. P. = Purchase. L. = Lease.

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine islands during the fiscal years 1910 to 1919.*

Species.	Fiscal year—				July 1 to Dec. 31, 1913.	Fiscal year—						Total 1910 to 1919.
	1910	1911	1912	1913		1914	1915	1916	1917	1918	1919	
Lauan	43,439	46,942	57,036	81,469	20,249	74,453	73,277	107,634	131,699	108,900	180,556	925,654
Apitong	20,764	21,096	28,929	32,391	12,905	32,328	38,849	56,529	55,335	56,274	72,223	423,623
Tangile	2,106	2,762	3,999	5,249	3,390	14,682	15,460	28,961	25,389	21,775	35,005	158,778
Guijo	14,107	14,231	18,579	17,279	7,841	19,701	15,650	16,685	16,857	17,301	25,924	184,155
Yakal	8,225	8,150	14,491	21,770	5,593	15,115	14,714	16,471	11,963	9,162	18,100	143,754
Ipil	13,717	12,296	17,237	15,791	7,535	17,602	12,089	14,147	16,629	15,498	18,926	161,467
Molave	8,923	7,978	9,091	9,363	4,783	9,753	10,546	10,788	13,582	22,233	26,088	133,128
Narra	5,744	4,996	8,474	8,877	3,941	8,467	9,868	7,970	5,904	7,848	11,152	83,241
Kalantas	3,174	1,368	938	3,320	886	2,423	1,999	4,574	7,381	4,975	5,040	36,078
Palosapis						2,222	1,631	2,723	3,042	8,863	15,661	34,142
Manggachapui						1,469	1,859	2,666	2,916	2,214	3,096	14,220
Dungon	2,453	1,693	1,213	931	601	2,199	1,467	1,127	1,592	1,318	1,839	16,433
Tindalo	954	1,018	794	932	484	914	1,181	1,115	1,145	826	1,080	10,443
Akle	809	867	1,295	1,690	729	1,287	1,498	1,088	798	870	937	11,868
Lumbayau									6,085	4,415	4,192	14,692
Pagatpat									1,502	849	2,766	5,117
Other species:												
First group	574	322	707	1,000	687	2,196	2,190	3,074	1,084	1,416	3,335	16,585
Second group	6,667	6,644	7,988	8,543	3,266	9,373	6,940	7,938	6,432	7,779	12,084	83,654
Third group	8,316	10,927	11,796	8,711	2,999	7,557	6,920	5,214	9,895	8,611	53,513	134,459
Fourth group	36,786	41,655	42,981	59,855	25,613	73,017	60,130	56,738	47,661	80,933	3,711	529,080
Total	176,758	182,945	225,548	277,171	101,502	294,758	276,268	341,442	366,891	382,060	495,228	3,120,571

TABLE NO. 3.—*Revenues derived from the sale of forest products and expenditures of the Bureau of Forestry since its organization, April 14, 1900.*

Fiscal year.	Revenue.	Expense.	Surplus.	Expense.
				Per cent.
1901 to 1906	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913	390,664	227,048	163,616	59
1913 (July to December 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
1917	536,328	281,126	255,202	53
1918	650,692	334,254	316,438	51
1919	805,229	473,242	331,986	58
Total	7,790,403	4,233,380	3,557,022	54.21

TABLE No. 4.—*Revenues from sale of forest products January 1 to December 31, 1919.*

Province.	Charges on forest product.								
	Timber.				Firewood.				
	First group ₱2.50 per cubic meter.	Second group ₱1.50 per cubic meter.	Third group ₱1 per cubic meter.	Fourth group ₱0.50 per cubic meter.	Bacauan and tangal ₱0.20 per cubic meter.	Other, 10 centavos per cubic meter.	Minor products.	Lease of forest lands.	Total.
Abra	₱2,184.64	₱1,129.67	₱236.47	₱132.52	₱122.15	₱191.80	₱205.92		₱4,203.17
Agusan	1,498.54	100.93	27.03	44.38	9.04		1,486.07		3,165.99
Albay	4,688.51	4,130.50	3,200.89	1,752.24	770.76	546.69	2,358.50		17,448.09
Ambos Camarines	2,069.66	1,820.32	3,487.51	2,073.39	1,054.79	2,698.32	8,816.52		22,020.51
Antique	577.09	87.80	54.17	109.29		11.50	380.84		1,220.69
Bataan	94.62	2,662.92	9,886.94	5,340.59	682.90	2,879.49	2,488.81		24,036.27
Batanes									
Batangas	1,056.26	410.69	38.53	205.12	115.40	1,668.95	4,928.29		8,423.24
Bohol	661.99	119.89	238.14	556.44	1,396.10	739.55	471.89		4,184.00
Bukidnon	114.30	23.66	5.01				61.15		204.12
Bulacan	1,578.81	1,516.99	2,291.89	3,078.99	85.27	204.95	1,441.86		10,198.76
Cagayan	20,190.23	1,702.68	4,066.35	554.87	141.54	395.61	4,945.82		31,997.10
Capiz	478.58	203.94	1,539.28	1,021.52	2,597.17	1,198.01	1,603.74		8,642.24
Cavite				10.29		336.28	660.08		1,006.65
Cebu	1,624.14	471.63	903.68	969.78	3,161.19	1,709.97	857.96		9,698.35
Cotabato	8,419.50	5,075.49	1,628.29	3,311.85	27.56	76.40	3,570.07		22,109.16
Davao	1,800.96	258.50	187.90	627.28	233.33	209.32	1,740.04		5,057.33
Ilocos Norte	734.67	616.15	176.21	140.23	42.60	120.55	258.01		2,088.42
Ilocos Sur	98.82	45.08	19.62	28.24	.80	62.80	637.58		892.94
Iloilo	1,368.88	762.65	1,412.98	804.01	2,126.17	2,202.52	8,340.80		17,018.01
Isabela	8,383.22	2,253.63	1,138.59	641.54	46.34	165.09	132.72		12,761.13
Laguna	172.75	900.91	1,786.25	1,267.13	4.34	1,035.69	1,287.31		6,454.38
Lanao	52.51	83.31	115.06	120.27	2.00	26.98	155.58		555.71
La Union	267.78	162.56	91.46	16.82	.32	1.68	223.93		764.55
Leyte	4,470.71	1,325.42	3,601.58	3,162.68	1,451.62	53.01	2,948.73		17,013.75
Manila	76,224.45	14,558.46	94,600.71	53,460.52	1,439.48	2,923.96	9,526.38	₱104.50	252,838.46
Mindoro	4,566.74	2,639.08	746.78	1,148.36	870.31	915.66	4,168.06		15,054.99
Misamis	1,225.71	888.17	1,373.68	817.34	60.18	53.12	1,042.24		5,460.44
Mountain	1,321.75	444.83	6,565.45	938.12	18.59	1,567.21	654.76		11,510.71
Negros Occidental	9,089.33	2,131.52	3,221.27	4,002.82	1,713.98	1,349.00	6,097.75		27,605.67
Negros Oriental	1,896.15	841.42	355.15	193.09	7.20	107.48	4,834.02		8,234.51
Nueva Ecija	1,986.28	938.22	76.89	127.38		166.36	2,363.62		5,658.75
Nueva Vizcaya	357.14	17.43	7.18	15.60		23.50	67.12		487.97
Palawan	2,138.55	60.99	43.24	105.89	134.78	140.27	3,213.98		5,837.70
Pampanga	221.51	398.65	810.00	406.34	103.20	637.98	764.63		3,342.31
Pangasinan	3,726.71	2,881.49	3,578.65	676.29	1,402.19	845.00	1,172.48		14,282.81
Rizal	206.37	188.70	55.79	851.76	6.00	1,769.02	2,004.82		5,082.46
Romblon	273.26	144.96	285.69	147.56	37.28	31.29	647.29		1,567.33

Samar	2,236.43	963.09	1,639.81	797.43	420.74	74.01	4,303.78		10,435.29
Sorsogon	11,523.68	2,846.08	1,799.86	4,028.78	1,633.99	766.59	3,750.03		26,349.01
Sulu	8,442.54	1,284.07	245.31	955.15	355.67	96.83	166.94		11,546.51
Surigao	556.88	258.00	332.74	134.71	428.01	15.10	2,803.02		4,528.46
Tarlac	404.48	166.20	23.59	138.93		210.68	1,203.49		2,147.37
Tayabas	60,540.35	3,770.03	4,137.73	2,195.87	6,144.50	7,591.45	18,570.61		102,950.54
Zambales	1,159.83	1,317.07	3,739.03	692.59	288.90	329.99	3,168.83		10,696.24
Zamboanga	9,608.43	6,351.31	14,991.45	10,533.12	1,164.30	185.63	5,612.40		48,446.64
Total charges	239,529.77	64,103.89	167,635.26	99,279.68	27,522.25	31,127.65	112,358.00	104.50	741,661.00
Total fines and penalties	20,763.97	4,851.20	7,128.57	9,057.44	2,778.44	5,207.64	13,780.47		63,567.73
Grand total	260,293.74	68,955.09	174,763.83	108,337.12	30,300.69	36,335.29	126,138.47	104.50	805,228.73

TABLE NO. 5.—*Timber licenses in force during fiscal year 1919 (January 1 to December 31).*

Province.	Timber licenses.					Gratuitous licenses.				
						For personal use.				
	For less than 100 cubic meters.	For 100 cubic meters and less than 1,000 cubic meters.	For 1,000 cubic meters and over.	Licenses agreements.	Total commercial licenses.	Inside communal forests.	Outside communal forests.	For public works.	Miner's gratuitous licenses.	Total.
Abra	50	59	-----	-----	109	9	5	3	-----	17
Albay	8	30	14	-----	52	20	36	1	1	58
Ambos Camarines	26	74	8	1	109	2	11	22	20	55
Antique	8	4	-----	-----	12	-----	-----	1	-----	1
Bataan	56	37	28	2	123	-----	2	4	-----	6
Batanes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Batangas	8	13	2	-----	23	1	1	-----	-----	2
Bohol	23	11	-----	-----	34	10	32	10	-----	52
Bulacan	3	56	4	-----	63	-----	3	5	8	16
Cagayan	5	125	7	-----	137	47	6	14	3	70
Capiz	39	58	3	-----	100	14	2	7	-----	23
Cavite	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Cebu	24	14	2	-----	40	6	15	2	2	25
Ilocos Norte	31	30	4	-----	65	18	-----	11	-----	29
Ilocos Sur	21	-----	-----	-----	21	13	-----	5	-----	18
Iloilo	14	34	2	-----	50	-----	1	1	-----	2
Isabela	52	36	1	-----	89	21	-----	8	-----	29
Laguna	37	48	4	-----	89	-----	17	5	-----	22
La Union	2	7	-----	-----	9	23	-----	1	-----	24
Leyte	53	96	8	-----	157	29	109	9	-----	147
Mindoro	17	71	18	-----	106	-----	8	1	-----	9
Misamis	16	10	2	-----	28	5	25	2	-----	32
Department of Mindanao and Sulu:										
Agusan	5	11	3	-----	19	16	83	2	1	102
Bukidnon	-----	2	1	-----	3	-----	1	-----	-----	1
Cotabato	2	3	5	-----	10	-----	1	1	-----	2
Davao	41	37	4	-----	82	-----	12	4	-----	16
Lanao	5	1	2	1	9	-----	-----	3	-----	3
Sulu	-----	3	9	-----	12	-----	-----	1	-----	1
Zamboanga	37	28	22	4	91	9	41	5	-----	55
Mountain Province	119	32	13	2	166	2	3	15	8	28
Nueva Ecija	13	36	7	-----	56	9	3	4	-----	16
Nueva Vizcaya	15	1	-----	-----	16	1	8	1	-----	10
Occidental Negros	11	57	14	2	84	2	1	2	-----	5
Oriental Negros	5	15	2	-----	22	4	5	5	-----	14
Palawan	17	6	42	-----	65	-----	18	4	2	24
Pampanga	3	16	3	-----	22	-----	-----	3	-----	3
Pangasinan	29	91	1	-----	121	31	4	8	-----	43
Rizal	8	26	-----	-----	34	-----	3	-----	-----	3
Romblon	10	9	2	-----	21	8	11	2	-----	21
Samar	72	75	10	-----	157	137	23	5	-----	165
Sorsogon	74	75	6	-----	155	1	35	5	13	54
Surigao	54	4	5	-----	63	13	62	4	1	80
Tarlac	5	14	1	-----	20	50	12	1	-----	63
Tayabas	44	157	42	1	244	24	4	7	3	38
Zambales	16	31	14	1	62	22	2	5	1	30
All provinces	-----	-----	-----	-----	-----	-----	-----	1	-----	1
Total	1,078	1,543	315	14	2,950	547	605	200	63	1,415

NOTE.—In Cagayan, Isabela, Nueva Vizcaya, La Union, Abra, Mountain Province, Ilocos Sur, Pangasinan, Nueva Ecija, and Tarlac, 1,009 licenses were issued for building tobacco curing houses.

TABLE NO. 6–*a.*—*Report of utilization of forest products from public forests of the Philippine Islands during the fiscal year 1919 (January 1 to December 31).*

Province.	Timber.					Firewood class.		Charcoal.	Dyewood.	Tanbark.	Dyebark.
	Group.				Total.						
	First.	Second.	Third.	Fourth.		First.	Second.				
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*		*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*
Abra	728	692	242	244	1,906	13	2,837			8,750	
Albay	1,759	2,716	2,598	2,126	9,199	3,658	1,878			5,874	
Ambos Camrines	508	913	7,625	5,899	14,945	7,689	23,337			127,130	
Antique	180	21	32	69	302					5,334	
Bataan	31	3,153	30,270	28,200	61,654	2,519	26,540	657		3,720	
Batangas	156	13	3	18	190		20,501	235		359,900	
Bohol	166	71	244	966	1,447	18,402	12,230			5,582	170
Bulacan	325	707	1,392	3,097	5,521	1,046	1,868	438		11,656	
Cagayan	7,323	683	3,286	746	12,038	479	2,863			11,541	
Capiz	80	138	1,306	1,102	2,626	12,963	11,156	218		5,552	3,362
Cavite		3		8	11		3,434	14		30,436	
Cebu	111	59	102	284	556	183	10,537	87		5,096	86
Ilocos Norte	257	328	157	184	926	29	653			27,468	1,600
Ilocos Sur	17	11	12	19	59		234			75,577	
Iloilo	70	94	202	341	707	7,645	21,489	269	1,778,328	211,816	
Isabela	2,475	1,413	1,009	698	5,595		669				
Laguna	15	402	1,575	1,696	3,688	118	8,507	1,331		24,708	
La Union	92	132	61	41	326	1	20			15,444	
Leyte	1,710	733	2,764	4,080	9,287	5,421	873	11		160	
Mindanao and Sulu:											
1. Agusan	725	62	3	9	799	205	30				
2. Bukidnon	17			23	40						
3. Cotabato	5,315	4,143	2,127	4,779	16,364	163	432				
4. Davao	424	94	121	309	948	1,117	337	22			
5. Lanao	756	439	26,535	14,308	42,038		339				
6. Sulu	2,008	1,013	313	812	4,146	1,121	1	35		15,650	
7. Zamboanga	5,107	6,640	15,881	34,412	62,040	4,170	1,249	144		273,603	380
Mindoro	3,146	5,682	1,803	1,983	12,614	8,060	11,882	16		182,030	20,792
Misamis	256	420	666	1,038	2,380	361	1,142			1,460	
Mountain Province	1,070	280	3,261	2,929	7,540		14,759	35		1,606	
Negros Occidental	2,668	1,225	62,944	46,827	113,664	11,627	8,080	15		352	
Negros Oriental	521	564	421	409	1,915	53	1,054			3,646	
Nueva Ecija	548	327	81	219	1,175		2,027	14		14,152	
Nueva Vizcaya	116	4	7	2	129		213				
Palawan	17,946	1,466	69	209	19,690	312	232			99,207	22,270
Pampanga	95	366	689	635	1,785	280	2,130	356		1,600	
Pangasinan	1,442	1,682	2,563	1,038	6,725	7,151	3,597	68	16,256	100,622	2,010
Rizal	26	84	46	930	1,086	4	1,760	677	200	14,939	1,000

TABLE No. 6–*a*.—*Report of utilization of forest products from public forests of the Philippine Islands during the fiscal year 1919 (January 1 to December 31)*—Continued.

Province.	Timber.					Firewood class.		Charcoal.	Dyewood.	Tanbark.	Dyebark.
	Group.				Total.						
	First.	Second.	Third.	Fourth.		First.	Second.				
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*		*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*
Romblon	113	108	118	58	397	59	200				
Samar	1,013	501	1,638	1,289	4,441	3,021	234			30,688	
Sorsogon	4,996	2,231	1,265	5,830	14,322	5,373	5,723	26		50,562	1,840
Surigao	174	145	638	53	1,010	1,160	70	10		18,383	
Tarlac	183	81	46	75	385		1,409	23		12,724	
Tayabas	19,545	2,410	17,535	3,776	43,266	32,270	43,302	439		41,737	11,356
Zambales	445	694	3,188	1,019	5,346	1,976	2,028	124			
Total	84,658	42,943	194,838	172,789	495,228	138,649	251,856	5,264	1,794,784	1,780,705	64,866

Province.	Wood-oils.	Copal (Almaciga).	Gutta-percha.	Split rattan.	Unsplit rattan.		Diliman.	Stone.	Lime stone.	Gogo.	Daluru.	Buri.
					Over 2 centimeters diameter.	Two cm. diameter or less.						
	Liters.	*Kilos.*	*Kilos.*	*Kilos.*	*Lin. m.*	*Lin. m.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Cu. m.*	*Kilos.*
Abra				80	60,000	277,200			8,000			
Albay				54,544		4,000						
Ambos Camarines		136,676		573,610	10,480	681,600	1,720	202	20,945	1,100		
Antique				8,659			3,786					6
Bataan				75,251	131,015	256,800	2,517			1,176		
Batangas				136						44,803		
Bohol	285	360		50						93		
Bulacan				13,595	105,070	1,030,398				186		
Cagayan		9,507		209,495	121,116	73,132						
Capiz				3,912			100			20		906
Cavite				300						4,344		
Cebu	40			2,480						237		
Ilocos Norte				892					10,532			
Ilocos Sur								115,355	124,635	232		
Iloilo				8,011			4,400					
Isabela					33,000	189,660						
Laguna				14,479	4,627	470	7,205			484		
La Union												
Leyte	33,400			23,630	75,103	93,949	10,590	534		114		

Mindanao and Sulu:												
1. Agusan				124,806	809	93,352	176					
2. Bukidnon				12,706	250							
3. Cotabato		425	17,405	2,222								
4. Davao		438,870		1,080		31,750						
5. Lanao			309	527			550					
6. Sulu				909								
7. Zamboanga		932	2,756	28,200	6,050	59,750				32		
Mindoro				92,867	7,500	126,819	53,416			4,252	40	3,455
Misamis			223	24,299		1,000	445					
Mountain Province				110,952	16,840	45,000		1,801	124,000			
Negros Occidental	22,271			361,388	11,000	30,806	5,227			3,977		
Negros Oriental	21,052	10,256		210,725	54,713	9,100	1,720			4,070		
Nueva Ecija				52,236	160,812	147,377				19,601		19,375
Nueva Vizcaya												
Palawan	530	49,704		11,558		1,092,117				5,633		
Pampanga				1,875	4,180	2,500	1,900			979	205	10,734
Pangasinan					4,000	14,152					38	573
Rizal				44,702	4,800	4,650				1,043		
Romblon	14,907	14,250		5,471		6,750						
Samar	7,064			154,570	7,704	6,102	9,270			10		
Sorsogon	8,938	494		200,561			3,339			265		63
Surigao	1,050			176,022	330							
Tarlac				40,094	1,120	67,360	10			14,092		
Tayabas		431,349		375,913	1,569,260	7,457,537	14,329	418		80		4,834
Zambales				37,129	160,450	3,444,906				23,304		
Total	109,536	1,092,823	20,693	3,059,936	2,550,229	15,248,237	120,700	118,290	288,112	130,127	283	39,946

TABLE NO. 6–*b*.—*Statement of forest products, cut or gathered from registered private woodlands during fiscal year 1919.*

Province.	Timber.					Fire-wood.	Char-coal.	Tan-bark.	Gogo.	Dye-bark.	Split rattan.	Dili-man.	White earth balls.	Daluru.
	First group.	Second group.	Third group.	Fourth group.	Total.									
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Cu. m.*	*Cu. m.*
Albay		77	38		115	20								
Ambos Camarines						2,753	16					2,389		
Bataan			128	8	136	1,826		210,675		10,500				
Batangas	15	128	24	13	180	3,703	15	1,027						
Bulacan						433								
Capiz						5,462	196	2,200	28					
Cavite						152								
Ilocos Norte	414	287	668		1,369	5,595	6,839	2,502					17,437	
Iloilo						2,253								
Laguna		9	14	14	37	128			3,345		12,660			
Mindoro	17	11		38	66	19,085	2,871							48
Negros Occidental	122	350	1,574	2,666	4,712	6,882	81					35		
Nueva Ecija	42	103			145	15,070	954							
Pampanga		1		59	60									
Rizal	73	4	1	17	95									
Tarlac	52	5	1	29	87									
Total	735	975	2,448	2,844	7,002	63,362	10,972	216,404	3,373	10,500	12,660	2,424	17,437	48

TABLE NO. 7.—*Minor product licenses in force during fiscal year 1919 (January 1 to December 31).*

Province.	Firewood.	Charcoal.	Dyewood.	Tanbarks and dye bark.	Wood oils.	Almaciga resins and others.	Gutta-percha.	Bejuco and dilliman.	Gogo.	Others.	Total.
Abra	25			1		1		21		3	51
Albay	55			7				54		2	118
Ambos Camarines	100	2		17		23		212	4	7	365
Antique	7			1				33		2	43
Bataan	57	14		3		6		94	25		199
Batanes											
Batangas	18			4		3				7	32
Bohol	27			2							29
Bulacan	6	14				4	1	35	8		68
Cagayan	47	1		3	1	38		122	1	1	214
Capiz	58	2		4	2	1		31	1	2	101
Cavite	8							3	2		13
Cebu	50	18		2				7			77
Ilocos Norte	17			1				6		4	28
Ilocos Sur	10	1		5		1				23	40
Iloilo	70	9	25	20	1	4		19	1	12	161
Isabela	29					6		36			71
Laguna	19	8		1	1	3		19	5	22	78
La Union	4	1		1					1		7
Leyte	60	2	2	4	4	2		56		43	173
Mindoro	75	5		50		2		95	33	2	262
Misamis	14		1	2	1	1	1	23	1	2	46
Department of Mindanao and Sulu:											
Agusan	5							45		2	52
Bukidnon								20			20
Cotabato	8		1		8	4	10	10		13	54
Davao	58	12	1	1	1	14	1	22		2	112
Lanao	14	1	1	3		1	2	10	1	2	35
Sulu	8		1	6	1	1	1	1	1	2	22
Zamboanga	84	5	1	26	1	11	12	70	1	2	213
Mountain Province	36	1		1		5		58		3	104
Nueva Ecija	26	4		4		2		59	56	12	163
Nueva Vizcaya	6		1					1			8
Occidental Negros	92	1		8	31	8		312	48	19	519
Oriental Negros	13				1			70	11	15	110
Palawan	61			56	3	29		48	13		210
Pampanga	9	8						10	2	3	32
Pangasinan	65	6	4	11		2		8	4	2	102
Rizal	30	16	2	5		2		24	12	3	94
Romblon	7			1	4	8		5	1	1	27
Samar	48	1		4	5	1		86		2	147
Sorsogon	88	6	4	11	3	2		93	6	2	215
Surigao	29	3		7	1	1		27	1	11	80
Tarlac	13	4		2		1		12	8	2	42
Tayabas	150	14		56	1	70		146	24	25	486
Zambales	59	12		6	1	6		52	20		156
Total	1,665	171	44	336	71	263	28	2,055	291	255	5,179

TABLE NO. 8.—*Statement showing the quantity and value of minor forest products exported during the fiscal year 1919 (January 1 to December 31).*

	Kilos.	Value.
Copal (almaciga):		
United States	120,523	₱40,797
United Kingdom	215,383	55,659
Belgium	5,692	1,800
France	5,800	1,507
Spain	11,240	5,800
China	843	450
British East Indies	492,133	75,952
Australasia	4,064	1,321
Total	855,678	183,286
Elemi (pili resin):		
United States	188,309	130,931
United Kingdom	37,931	24,262
Belgium	337	320
Spain	360	288
Total	226,937	155,801
Gutta-percha:		
United States	4,497	3,500
British East Indies	33,533	33,442
Total	38,030	36,942
Rubber:		
United States	86,134	139,971
Hongkong	589	76
Japan	80	20
Total	86,803	140,067
Lumbang (candle nut) oil:		
United States	138,620	92,843
Sappan wood (sibukau):		
China	1,484,684	72,989
Hongkong	757,820	38,495
Total	2,242,504	111,484
Total		720,423

TABLE NO. 9.—*Statement of appropriation and expenditures, Bureau of Forestry (January 1 to December 31, 1919).*

Appropriation:		
Act No. 2785		₱505,650
Expenditures:		
Salaries and wages	₱279,450.01	
Bonus	53,913.85	
Furniture and equipment	13,915.94	
Traveling expenses of personnel	51,204.26	
Rentals of buildings and grounds	6,060.42	
Freight, express, and delivery service	2,926.59	
Printing and binding reports, documents and publications	5,000.00	
Postal, telegraph, and cable service	5,091.20	
Illumination and power service	2,253.02	
Plant and equipment repair service	1,172.39	
Contingent service	1,999.08	
Consumption of supplies and materials	34,490.16	
Travel expense of persons not Government employees	377.44	
Total expenditures		457,854.36
Balance January 1, 1920		47,795.64
Appropriation for Cebu reforestation (Act No. 2649) Balance January 1, 1919		995.27
Expenditures:		
Salaries and wages	499.01	
Traveling expenses of personnel	257.32	
Rentals of buildings and grounds	3.50	
Freight, express, and delivery service	124.85	
Postal, telegraph, and cable service	9.56	
Consumption of supplies and materials	7.33	
Travel expense of persons not Government employees	1.00	
Total expenditures		902.57
Balance January 1, 1920		92.70
Appropriation for Davao forest reconnaissance (Act No. 2859)		15,000.00
Expenditures:		
Furniture and equipment	1,057.38	
Traveling expenses of personnel	9,723.30	
Rentals of buildings and grounds	10.00	
Freight, express, and delivery service	77.62	
Postal, telegraph, and cable service	74.48	
Contingent service	36.50	
Consumption of supplies and materials	3,506.16	
Total expenditures		14,485.44
Balance January 1, 1920		514.56
Appropriation for construction of six forest stations (Act No. 2736).		
Balance January 1, 1919		3,517.24
Expenditures		3,509.15
Balance January 1, 1920		8.09
Appropriation for construction of road, Los Baños (Act No. 2736).		
Balance January 1, 1919		7,939.19
Expenditures		7,939.18
Balance January 1, 1920		.01
Appropriation for construction of a fire-proof vault (Act No. 2786)		15,000.00
Expenditures		12,692.81
Balance January 1, 1920		2,307.19
Appropriation for construction of three forest stations (Act No. 2786)		5,000.00
Balance January 1, 1920		5,000.00
Appropriation for installation of an electric lighting system, Los Baños (Act No. 2786)		6,000.00
Balance January 1, 1920		6,000.00
Statement of Bureau of Forestry appropriations, expenditures and revenues for fiscal year 1919:		
Appropriations		521,645.27
Revenue		805,228.73
Expenditures		473,242.37
Surplus		331,896.36
Percentage of expenditures to revenue		.58

E R R A T A .

Page 19, line 41, "hase" should read "has".

Page 21, line 4, "Jolo" should read "Sulu".

Page 24, line 8, "homsteaders" should read "homesteaders".

Page 36, line 31, "is" should read "are".

Page 37, line 19, "cutting" should read "cuttings".

Page 42, line 14, "forest" should read "forests".

Page 45, line 27, "Pacdacal" should read "Pacdal".

Page 46, line 28, "developement" should read "development"

Page 50, line 17, "receive" should read "received".

Page 65, line 34, "Commercial" should read "Communal".

Page 68, line 27, "it" should read "to"

Page 71, line 25, "propetuation" should read "perpetuation".

Page 75, line 19, "other" should read "others".

Page 83, line 8, "to" should read "for".

Page 83, line 20, "₱0.93 .. ₱418.50" should read "₱1.33 .. ₱598.50".

Page 84, line 7, "72.00" should read "72.20".

Page 86, line 37, "Only" should read "On".

Page 89, line 14, "include" should read "included".

Page 91, line 1, "general section" should read "general service section".

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1920

ARTHUR F. FISCHER
Director of Forestry

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY.

MANILA, *March 1, 1921.*

SIR: In the absence on leave in the United States of the Director, I have the honor to submit the Annual Report of the Bureau of Forestry for the fiscal year ending December 31, 1920.

LEGISLATION.

Act 2898, appropriating the sum of ₱4,000 for the purchase and installation of a plant for distilling water for the Forest School at Los Baños, Act 2902, amending section 1840 of the Administrative Code, to extend the period for the free cutting of second and lower group timbers until October 25, 1925, and Act 2906, assigning the sum of ₱23,208.33 to be used in the classification of lands are the laws affecting the Bureau of Forestry which were passed during the year 1920.

Other legislative matters issued which affect the Bureau are:

By the Governor-General: Proclamation No. 60, series of 1920, changing the name of the Mount Makiling Forest Reserve to "The Mount Makiling National Botanic Garden."

By the Department of Agriculture and Natural Resources: Amendment of section 12 of the Forest Regulations regarding kaingins; Administrative Circular No. 5, series of 1920, new schedule of charges to be collected for certain classes of work executed by the Bureau of Forestry; Administrative Circular No. 7, series of 1920, regarding the bond to be exacted before issuing any ordinary license.

By the Department of Finance: Regulation No. 18 (Sept. 30, 1920) increasing the forest charges on minor products.

Beside the above, this Bureau submitted to the Committee on Finance a proposed law increasing the forest charges and establishing a more efficient system for the classification of forest products, the collection of forest charges and the compilation of statistics of forest utilization, and a new standardization of the salaries of the Bureau of Forestry personnel.

PERSONNEL.

The question of personnel, especially that of the field force, which has for years been becoming increasingly acute, finally

reached such a state that it was necessary to appeal to His Excellency, the Governor-General, to revise the civil service standing of rangers, who had been rated as second grade civil service employees eligible to a maximum salary of ₱1,800 per annum. The Governor-General changed this rating, and now Rangers are in a special classification because of their training and will receive an entrance salary of ₱900 to ₱1,080, depending upon their education, and can attain a maximum salary of ₱2,400.

As for the higher technical force, the same difficulties as before have been encountered, it being impossible to secure experienced foresters at the salary that can be offered to them.

The high cost of living and also the higher pay and better opportunities offered by others to the field and office force have given rise to a continuous stream of resignations. In spite of the restrictions placed upon resignations and of efforts to hold the men, forty-three persons resigned. These are classed as follows: Three technical men; 1 lumber inspector; 2 foresters; 15 rangers (all of these vacancies remain unfilled); 20 clerks and 2 draftsmen. These resignations, together with the absences of men on leave, have seriously curtailed and hampered the work of the Bureau.

The classified force on December 31, 1920, consisted of: One Director (on leave), 9 foresters, 1 technical employee, 1 lumber inspector, 1 wood expert, 1 assistant forester, 11 forest supervisors (9 in active service, 2 in the United States as pensionados), 121 rangers, 7 draftsmen, 43 clerks and 2 messengers, making a total of 198. The temporary employees were: Four rangers, 1 proofreader, 104 guards, 2 junior stenographers, 10 clerks, 3 draftsmen, 5 nurserymen, 7 carpenters, 2 varnishers, 1 chauffeur, 1 messenger, 2 watchmen, 5 janitors, and 1 laborer, making a total of 148. The entire force on December 31, 1920, was therefore 346 employees.

DIVISION OF FOREST MANAGEMENT.

The Division of Forest Management is charged with the use and protection of the forests of the Philippines, the investigation of the extent of forest resources, the inspection of licenses and the supervision of the work of the field forces.

At the end of the year there were on the rolls of this Division, the following field and office force: Four foresters, one assistant forester, six forest supervisors, seventy-two rangers, thirty-two guards, and eighteen clerks.

The force of this Division has maintained a high standard of efficiency notwithstanding the increased volume of work and

of handicaps owing to lack of personnel and appropriation. It is perhaps unnecessary to call attention to the fact that these men are receiving lower salaries than those paid to men of similar technical positions and responsabilities in other Bureaus and much less than what their former colleagues are earning in civil life. Also, their field work entails unusually heavy expenses for shoes and clothing, and, owing to their very limited income, they are unable to support themselves and their families except at a scale of living which is intolerable to University graduates. This state of affairs has a disastrous effect, not only upon the personnel, but also upon the service, inasmuch as the wealthy and educated class of our society can not become properly acquainted with our aims and policies through the Rangers due to that lack of association and contact which would otherwise be possible, were the rangers given such remuneration as would better their living conditions, and enable them to assume their proper place in the life and activities of the community.

The foregoing is cited as one of the reasons for requesting better remuneration for the personnel of this Division, aside from the fact that higher pay and better opportunities are offered outside to the men. This subject is more fully discussed under "Personnel."

INSPECTION.

The following table shows the Forest Stations throughout the thirteen districts inspected during the year 1920 by the supervising personnel of the Manila office:

District No.	Station.	Inspected by—	Date, 1920.	Report.
	Aparri	A. Suyat	July 1–5	1
1	Alcala	do	June 28–29	1
	Ilagan	do	June 25–26	1
	Echague	do	June 18–23	1
2	Vigan	do	July 7	1
	Bangued	do	July 9	1
3	Baguio	E. C. Leaño	Oct. and Nov	
	Tagudin	A. Suyat	July 11	
	Dagupan	do	Jan. 8	
	Cabanatuan	do	Feb. 9	
4	Do	P. San Buenaventura	June 13	
	Cuyapo	A. Suyat	May 24	
	Bayombong	do	June 14–16	1
	Laguimanoc	do	March 11–12	1
5	Calauag	D. P. Miranda	Oct. 9–15	1
	Baler	P. San Buenaventura	June 5–9	1
	Naga	E. C. Leaño	June 18–20	1
	Do	P. San Buenaventura	Nov. 6–8	1
	Paracale	E. C. Leaño	June 30–July 2	1
	Legaspi	do	June 13–14	1
	Sorsogon	P. San Buenaventura	Oct. 26–Nov. 4	1
6	Legaspi	do	Oct. 22–23	
	Sorsogon	do	Nov. 26–Dec. 9	
	Do	E. C. Leaño	June 10–11	1
	Catabañgan	D. P. Miranda	Oct. 16–30	
	Virac	do	May 18–20	1
	Iloilo	P. San Buenaventura	Feb. 26	
	Do	F. L. Pray	July 6–7	
	Do	A. Suyat	Dec. 16	
	New Washington	do	July 18	
7	Do	P. San Buenaventura	Feb. 27–28	
	Cadiz	F. L. Pray	July 1–2	
	San Carlos	P. San Buenaventura	Feb. 21–23	
	Do	A. Suyat	Oct. 5–Dec. 15	
	Fabrica	D. P. Miranda	May 26–June 30	
	Ilog	F. L. Pray	July 18–19	
8	None			
9	Puerto Princesa	A. L. Cenabre	March 15	1
	Tacloban	P. San Buenaventura	May 2–5	1
	Do	D. P. Miranda	Jan. 1–26	
10	Catbalogan	P. San Buenaventura	April 24–26	1
	Masbate	do	April 21	
	Do	do	Aug. 10–13	
	Tanay	P. San Buenaventura	June 28–29	1
11	Orani	do	March 21	1
	Do	Pray, Buenaventura, and Miranda	Sept. 10–11	
	Limay	D. P. Miranda	Sept. 12–13	
11	Arayat	A. Suyat	Sept. 16–18	
	Orani	A. L. Cenabre	Dec. 22–28	
	Norzagaray	P. San Buenaventura	March	
	Calapan	A. Suyat	March 9	1
12	San Jose	do	April 22–May 7	3
	Cebu	P. San Buenaventura	Feb. 17–18	
	Talisay	do	Feb. 13–15	1
13	Cebu	do	May 13–15	

The foregoing table shows that there were more forest districts inspected in 1920 than in the past year. More extensive inspections might have been made, but only five of the nine forest supervisors were able to go into the field, three having been more or less permanently assigned to the Manila

office, while the other two are in the United States as Government pensionados.

In addition to inspecting the activities of the forest officers in the provinces, aiding them in the solution of the different forest problems in their respective districts and in the investigation of troubles between licensees, or between licensees and forest officers, the forest supervisors have also coöperated with the Division of Forest Lands and Maps in reconnaissance work and in the classification of public lands. One forest supervisor is assigned to the Division of Sawmills and Utilization to inspect the work of ranger-scalers and the operation of sawmills.

LICENSE STATISTICS.

During the year 1920, there was a decrease of 470 in the number of ordinary timber licenses issued as compared with 1919, a total of 2,480 being in force at the end of the year. (This does not include those which were returned or cancelled, which totaled 250.) This decrease was due in part to a considerable increase in the number of sawmills, for which larger license areas were created by the consolidation of several small license areas, and in part by the cancellation of licenses which were not being used.

In respect to gratuitous licenses, there was a very noticeable increase, only 1,415 being issued in 1919, whereas this year there were 2,691, an increase of 1,276. This is attributable to the general prosperity of the Islands during the year and the higher living standard prompted by more general education, which resulted in the building of better homes under the Free Use Law. Also, the excessively high prices of lumber in the local markets prompted the people to get their own timber.

In addition to the above, there were 728 tobacco curing house gratuitous licenses issued during the year.

Of licenses covering minor forest products, a total of 3,911 were issued, showing a decrease of 1,268 from those of the previous year. The diminution was due in part to the exhaustion of firewood areas during the previous two years, when the high price of coal forced the use of firewood as a substitute, and to the greatly reduced market price of rattan, which has caused its collection to be suspended in many districts.

Tables showing in detail the licenses issued and the amount of forest products utilized during the year and a comparison

of the totals of each with those of the previous year will be found in the appendix.

OFFENSES OF LICENSEES.

There was a considerable decrease in the offenses of licensees during 1920, due to more frequent inspections of license areas, the increased efficiency in patrol work by forest guards and partly to a fuller realization by the licensees of their obligation to observe the rules and regulations of the Bureau of Forestry and of the fact that violations of the same would cause the forfeiture of the license.

Of the two new causes of trouble in the management of licenses described in last year's report, viz.: (1) Trading in licenses, and (2) the attempts by licensees, or persons interested in a license, to enlarge their territory to the prejudice of adjacent licensees, there has been little or no improvement in the former case, but a marked improvement has taken place in the latter, due mainly to the more careful location of the boundaries of all license areas, particular attention having been paid to this by the forest officers when they inspected the areas. Continued improvement was noted in the reduction of the amount of wasted and abandoned forest products due undoubtedly to the realization on the part of the licenses that they would have to pay for such material owing to the more frequent inspections by forest officers.

OFFENSES OF NON-LICENSEES.

The campaign of education on forestry subjects, the increased number of inspections of license areas and the more extensive and intensive patrol work by forest guards, together with the closer supervision of their cutting areas by the licensees, have materially reduced the illegal cutting by non-licensees.

The noted increase in the item "Total fines and penalties" as given in Table No. 4 in the appendix is due to increased activities in the production of manufactured ties, on which the surcharges for manufactured timber are imposed, and to kaingin cases acted upon administratively.

FUTURE SPECIAL WORK.

1. Every effort will be made to obtain a permanent corps of forest guards. These men should be put on a permanent basis, under the Bureau of Civil Service, in order to keep them after they have been trained. The employment of guards is warranted by the fact that the experienced guards are turning

in invoices for timber and other forest products cut illegally, which total more than their expenses and salaries, thus showing a clear profit for the government in such work as kaingin prevention, inspection of licenses, and the reduction of theft of forest products and other violations of the forest laws. This benefit always follows the inauguration of an adequate patrol and inspection system.

2. There will be a continuation of mangrove swamp work, namely: Mapping, inspection of cutting areas, planting supervision and the study and development of fishponds, in connection with the scientific management of the mangrove swamps.

3. The deposit of bonds guaranteeing the good faith and conduct of the licensees has become an imperative necessity. It is proposed to require each licensee to deposit with the Director of Forestry a cash bond amounting to ten per cent of the value of the forest charges on the total quantity of forest products granted on the face of the license. This will cause the prospective licensee to apply only for the amount of forest products which he will be reasonably certain of cutting, and it will also enable the forest officers to judge of the extent of territory which will be required to meet the needs of the licensee. This bond should also do away with applications from those persons who apply for a license with the sole intention of speculating (selling the cutting privileges) in the same.

SPECIAL PERMITS SECTION.

The work of this section, which consists in carrying out the provisions of section 1838 of the Administrative Code and the issuance of ordinary minor products licenses falling under lease, agreement, or the special use clauses in the above-mentioned section, as well as the issuance of kaingin permits, has from its organization in the latter part of 1919 been entrusted to different forest supervisors, and not until the middle of the year has a forest supervisor been permanently assigned to take charge of the section. A senior ranger has been designated to assist him in this work.

The ranger assistant has devoted almost all of his time to investigative work in the field, thus leaving the office work entirely in the hands of the forest supervisor in charge. In spite of this fact, and considering the great mass of correspondence and applications for special uses that have been filed, it is gratifying to note that this section has been running satisfactorily, and it is hoped that in the coming year the work will be further developed.

SPECIAL USES.

Up to the end of the year, there were issued 5 lease agreements for fishponds, 7 for saltworks and 1 for a sawmill site, 13 pastures permits, and 1 minor product license agreement, as compared with 2 fishpond lease agreements and 1 pasture permit for the previous year.

The following applications on different special uses are held pending: Thirty-eight with contracts prepared, but awaiting the applicants' signatures; 13 with contracts approved by the Department Secretary, but pending receipt of the required bonds from the applicants; 9 with action suspended until such time as the competent court has duly determined the conflicting claims on the areas applied for; 51 with necessary contracts prepared, but to be checked first before sending them to the applicants for signature; and 31 awaiting examination by the field force.

The foregoing figures show that, as the benefits of section 1838 of the Administrative Code became better known throughout the provinces, there has been an increase in the number of applications and, of course, this involved a corresponding increase in the work of the Bureau. The inability of the present personnel to make the necessary examinations as promptly as is desirable is a subject worthy of careful consideration.

KAIÑGINS.

The total number of illegal kaiñgins reported to the courts during the year amounted to 721 as against 603 during 1919. which shows an increase of 118. The number of successful cases amounted to 184 as against 156 during 1919, or an increase of 28. These results are due to four factors: (1) Greater ability in the presentation of evidence displayed by the field force; (2) more time devoted by the field force to this kind of work; (3) gratifying coöperation of the provincial fiscals; and (4) better understanding on the part of the justices of the peace, who handled most of the cases, of the importance of preventing the destruction of public forests by kaiñgin makers. This Bureau, therefore, did not have any occasion to complain, as it did in the past years, as regards the coöperation on the part of the provincial fiscals and the justices of the peace. Part of the kaiñgins can be attributed to the efforts of persons who are trying to increase their land holdings and also to a misunderstanding of the food campaign. The following table shows

the number of kaiñgin cases reported from each province with the number acted upon during the year:

Kaiñgins reported during the fiscal year 1920. (January 1 to December 31, 1920.)

Province.	Reported by—		Total.	Acted on—		Total.
	Forest officers.	Municipal president.		Convicted.	Acquitted.	
Abra						
Agusan						
Albay	22		22			
Ambos Camarines	42		42		1	1
Antique	17		17			
Bataan						
Batanes						
Batangas						
Bohol		2	2	2	2	2
Bukidnon						
Bulacan	17		17	17		17
Cagayan						
Capiz	19		19	8		8
Cavite						
Cebu	7		7		1	1
Cotabato						
Davao	1		1		1	1
Ilocos Norte						
Ilocos Sur						
Iloilo	2		2			
Isabela						
Laguna						
Lanao						
La Union						
Leyte	57		57	27	5	32
Marinduque						
Mindoro	28		28			
Misamis	16		16			
Mountain Province						
Nueva Ecija		3	3	3		3
Nueva Vizcaya						
Negros Occidental	81		81	38	9	47
Negros Oriental	2		2	1		1
Palawan	23		23			
Pampanga	28		28	5	9	14
Pangasinan	52		52			
Rizal	10		10		6	6
Romblon	47		47			
Samar	50		50	35		35
Sorsogon	177		177	39		39
Sulu						
Surigao						
Tarlac						
Tayabas	10		10	9		9
Zambales	8		8			
Zamboanga						
Total	716	5	721	184	32	216

FOREST DISTRICTS AND STATIONS.

For the purpose of administering the field work of the Bureau of Forestry, the Philippine Islands have been divided into thirteen districts with Foresters or competent Rangers in charge of each.

In each district there are forest stations which are so located as to administer the work to the best advantage. From time to time, as lumbering develops or new roads are opened or steam-

ship service improves, new stations are added or old ones transferred to other points. A number of changes have been made during the year.

During 1920, new stations were opened at:

Claveria, Cagayan Province	District No. 1.
Cabibihan, Tayabas Province	District No. 5.
Cagayan, Misamis Province	District No. 8.
Port Lebak, Cotabato Province	District No. 8.
Maluso, Zamboanga Province	District No. 8.
Jolo, Sulu Province	District No. 8.
Mati, Davao Province	District No. 8.
Laoang, Samar	District No. 10.

The Forest Stations at Baler of District No. 5, Tagudin of District No. 3, and Cabanatuan of District No. 4, were closed.

SUMMARY OF REPORTS FROM FOREST DISTRICTS.

The following are extracts from the annual reports submitted by the officers in charge of districts. Many of these reports contain considerable information which is omitted for lack of space.

District No. 1: Headquarters, Aparri, Cagayan.—Provinces: Cagayan, Isabela, and the northern portion of Ilocos Norte.

Area: 10,155.6 square miles.

Personnel on December 31, 1920: Five rangers, 1 forest guard, and 1 clerk.

In spite of the business depression since September, all licenses have been very busy because the price received for timber doubled during the year. Lack of transportation has hampered the delivery of some timber, but as a rule logs were sold and used as soon as they were brought to a market.

Rattan collecting has been pushed, but even so, the demand was so great that the price of split baling rattan 5½ meters long rose to ₱22 per thousand.

Zones were established within which persons, especially mountaineers, who had no work animals could clear land and plant crops. This method obviates the need of granting individual permits to clear land and at the same time protects the forests from destruction by irresponsible settlers.

District No. 2: Headquarters, Vigan, Ilocos Sur.—Provinces: Ilocos Norte (except Bangui), Ilocos Sur, and Abra.

Area: 3,588.8 square miles.

Personnel on December 31, 1920: Three rangers and 3 forest guards.

All timber cut in the district is solely for local use. Abra Province exported scarcely any logs, as all were used in local

public works. The result was that Vigan and the coast towns in general were obliged to get timber elsewhere.

The conditions in the forests are satisfactory, but unfortunately there are not enough men in the service to prevent the cutting of seed trees which have been left by licensees to restock the forest. It is necessary to appoint firewardens to protect the recently planted areas near certain towns of this district.

No illegal kaiñgins were found in public forest. Permits to clear brush land were issued to 161 persons who employed over 400 people to help them clear the land on shares.

Twelve reforestation plots and two forest tree nurseries are located in a dozen towns of the district, and these are serving as an object lesson in reclaiming unproductive kogon land. This work should be extended as rapidly as means will permit.

District No. 3: Headquarters, Baguio, Mountain Province.—Sub-provinces: Amburayan, Benguet, Bontoc, and Lepanto.

Area: 3,419.6 square miles.

Personnel: 1 forester, 3 rangers, and 9 guards.

The local demand for timber has been very large, in fact larger than the mills could supply. The Heald Mill has installed new equipment and is now in a position to fill all orders.

The miners have been busy cutting mine props and lumber for themselves. Over 16,000 board feet were sent to La Union for a bridge and a wharf.

Nearly 15,000 cubic meters of firewood were invoiced during the year and providing for a future supply is a serious problem.

The making of charcoal is proving profitable, and for this purpose, licenses have been issued in localities where logging waste which could not be used as firewood could be converted into charcoal.

All reforestation work in this district is dependent upon the prevention of fires. Until fires can be prevented or extinguished promptly when started, it will be useless to expect pine trees to occupy the grass covered hills. As the development of Mountain Province and especially of the mines is dependent upon timber, a serious effort should be made to carry on systematic fire protection work on a large scale. The present force is as large as funds will permit, but is entirely inadequate to cope with the extreme fire hazard found in the grass lands. The restriction of grazing to open land has done much to reduce the number of fires, but there is nothing to prevent the spread of fires if once they get started.

Furthermore, any control of floods in Pangasinan and development of hydro-electric projects on the Agno River are de-

pendent upon the forest cover of the mountains comprising the basin of this river. It is safe to say that over three-fourths of the mountainous region in which this river rises is grass land. The slopes are steep and the surface run off is very rapid, thus giving rise to destructive freshets in the plains of Pangasinan. Diverting the river into swamps in Tarlac and Pangasinan will relieve the situation, but it will not remove the cause of the floods.

District No. 4: Headquarters, Dagupan, Pangasinan.—Provinces: Nueva Ecija, Nueva Vizcaya, Pangasinan, Tarlac, and Union.

Area: 8,718.0 square miles.

Personnel: 5 rangers and 7 forest guards.

All lumber used in this district comes from Manila or from Masinloc, Zambales. However, logging in the district was very active, particularly in securing posts both for house construction and for electric transmission lines, until the floods on the Agno River for two months and the scarcity of laborers during the rice harvest stopped operations, leaving many contracts unfulfilled.

The Luzon Ship Building Company has a small mill for cutting logs. Such material as is not needed for the ships is sold at Dagupan. Two schooners, a launch and over twenty lighters were completed during the year and others are on the ways.

The number of minor product licenses decreased because inactive licensees were requested to return their licenses.

The extensive inspection trips of forest officers resulted in invoicing abandoned or stolen timber amounting to ₱3,300.

The most important lines of work for the coming year are the establishment of concessions in mangrove swamps and the establishment of forest zones in the district, and if funds permit, reforestation work should be undertaken in Union Province and elsewhere where the lack of water for irrigation is felt. In 1917, a farmer of Salasa, upon the recommendation of the Bureau of Forestry planted ipil-ipil (*Leucaena glauca*), in a kogon-covered valley which had been kaiñgined in 1915. Before 1915, he depended upon a spring for water to irrigate his field, but after the hill sides had been cleared off, the spring had dried up. The ipil-ipil has established a good forest cover and the spring is now flowing all year long.

Farmers around Mount Balungao, Pangasinan, are clamoring for reforestation because the springs at the base of that peak have dried up.

District No 5: Headquarters, Los Baños, Laguna.—Provinces: Batangas, Laguna, Marinduque, and Tayabas.

Area: 6,184.9 square miles.

Personnel: 1 forester, 9 rangers, 1 guard scaler, 12 guards, and 1 clerk.

Because of the high prices received for copra and abaca during the year 1919, there was considerable building going on during 1920. Concrete warehouses, stores and residences were built and a large number of wooden houses were erected in every town.

The mills at Calauag and Kabibihan furnished most of the lumber and local licensees furnished house posts and special dimension stuff. High wages, the lack of laborers, and the slump in the copra and abaca market had their effect upon the lumber output and toward the end of 1920 there was a great decrease.

A number of small licensees are ordering or erecting sawmills and it is feared that they are doomed to failure because the number of competent sawmill operators in the Philippines is limited. However, there is no reason why they should not succeed with competent managers in charge, for the supply and the market are both ample. One mill is shipping two carloads of ties per day for railroads in China. The climate of China will permit the use of apitong ties.

The change in the land law is not fully understood by the people and it is feared that misinformed or unscrupulous persons will occupy forest land and destroy forests under the pretext that they are homesteaders. In order to prevent this and other abuses, it is recommended that permanent national forests be established as soon as possible and that every effort be made to dispose of the timber upon agricultural land either by selling it to licensees or to purchasers of the land. It is further recommended that licensees be required to clear cut on agricultural land in order that it may be certified for agriculture.

District No. 6: Headquarters, Naga, Camarines Sur.—Provinces: Camarines Norte, Camarines Sur, Albay, Sorsogon, and Catanduanes.

Area: 6,665.5 square miles.

Personnel: 8 rangers, 2 guard-scalers, 10 forest guards, and 1 clerk.

There hase been a great increase in the activities of timber and firewood licensees, except in Paracale, where mining operations were suspended while the dredges were shifted to new

placer claims. The increased output can be attributed to high prices, abundant labor and better transportation. The increased demand for timber is accounted for by new railroad construction, development work on the Batan Island coal mines, installation of six new municipal electric lighting systems and the extension of others, rebuilding after the Legaspi fire, general building in the district and export to Manila. In 1919 only five licensees shipped logs to Manila. During 1920 practically all licensees on the west coast and five on the east coast of the district sent logs to Manila. Schooners equipped with motors are responsible for this sudden development in the logging industry.

Eight shipyards are in operation, two being newly established. These yards turn out motor launches, native sail boats, schooners and occasionally schooners with motors. Three of these yards have their own vessels to bring them lumber.

As a result of this activity, the demand for licenses is so great that several applicants have offered to pay forest charges in advance, if necessary, in order to get licenses. The price paid for narra trees growing in abaca plantations, ranges from two to ten pesos and abaca growers are therefore felling most of the narra shade trees.

The establishment of forest zones has been begun and should be pushed with vigor in order to prevent further encroachment upon the forests.

District No. 7: Headquarters, Iloilo, Iloilo.—Provinces: Antique, Capiz, Iloilo, and Occidental Negros.

Area: 8,332.9 square miles.

Personnel, December 31, 1920: 11 rangers, 4 guard scalers, and 14 guards.

Lumber dealers report that they are selling twice as much lumber as formerly and that they cannot supply the demand. The high price received for sugar has stimulated building throughout the district, hence the demand for lumber, although the price of the latter has also doubled.

The great demand for timber of course attracted persons who cut and sold timber without paying for it. The forest charges on products cut by such persons as were detected by forest officers amounted to more than ₱14,000.

The over-cut mangrove swamps are in crying need of reforestation and protection. During the fuel famine, it was necessary to get firewood wherever possible, and as a result mangrove swamps have been stripped of all but the least salable species. Unless something is done, the extensive swamps near

Iloilo will be restocked by the most worthless species and will thus be ruined as a future source of firewood.

District No. 8: Headquarters, Zamboanga, Zamboanga.—Provinces: Bukidnon, Misamis, Cotabato, Davao, Jolo, Lanao, and Zamboanga.

Area: 31,899.6 square miles.

Personnel: 1 forester, 17 rangers, 5 guard-scalers, 9 forest guards, and 1 clerk.

Although all 15 mills have been busy, yet over 200,000 board feet of lumber were imported, via Jolo, from Borneo. On the other hand, the mills have exported nearly two million board feet to China and to the United States and requests have been received from Java and the Straits Settlements as to the possibility of furnishing 30,000,000 board feet. Seven caterpillar tractors are being tried out with very satisfactory results.

The time of the personnel is taken up with the operations of the licensees and no research work has been attempted. Such work should be undertaken early, preferably by trained men from the Division of Investigation. An effort will be made to place the mangrove swamps under management, because those near the large cities are becoming depleted. However, unless more men are available this and other will have to wait for a favorable opportunity.

The Jolo Teak Reservation is being logged by the provincial government and this is the time to undertake reforestation work there, as the forest is too open to produce as much timber as it should.

Very little can be done to check the destruction of forests by nomadic cultivators, because they lack animals or implements with which to plow the land and thus combat the grasses which are the bane of all farmers. An increase in personnel will enable forest officers to solve this problem properly by assigning settlers to brush land and showing them how to eradicate kogon by means of ipil-ipil or other shrubs, thus enabling the people to shift in a regular rotation from one parcel of brush land to an adjacent parcel until such time as they can plow the land and place the entire tract under cultivation.

District No. 9: Headquarters, Puerto Princesa, Palawan.—Province: Palawan.

Area: 5,617 square miles.

Personnel: 4 rangers and 1 forest guard.

The timber licensees have been unusually active trying to supply the demand for timber. As a result four licensees are using

tractors and twenty-two launches are in use towing logs from points along the coast to a safe anchorage where they can be loaded on steamers or schooners. One result of using tractors is that logs which had lain in the woods for years because carabaos could not drag them out were handled with ease by a tractor.

In the midst of this prosperity, the money stringency made itself felt and all licensees have large stocks of timber on hand.

A closer supervision of loading operations was possible and there has been an increase in the forest charges collected.

The operations of the licensees are such that only ipil and kalantas are cut, leaving other valuable trees in the forest. Because the ships that touch at Palawan stop only at Manila, the Iloilo market has not been developed. It will be only a question of a short time before lumber dealers of Iloilo will be sending ships to Palawan for logs and, when that time comes, all merchantable logs will find a ready market. No mills have been established because the labor supply is scanty.

Palawan has extensive mangrove swamps which should be placed under management before they are destroyed by reckless cutting. However, this work cannot receive the attention it deserves unless a larger and more permanent force be provided.

There was an increase in the number of kaiñgins in Busuanga, which is attributed to the fact that the local forest officer was transferred and as the people believed that the station was closed they had no fear of detection and began destroying forests.

District No. 10: Headquarters, Tacloban, Leyte.—Provinces: Samar, Leyte (eastern part), Surigao, and Masbate.

Area: 11,124.2 square miles.

Personnel on December 31: 9 rangers, 1 guard-scaler, 7 forest guards, and 1 clerk.

Owing to the topography being suited for small operators all mills in the district are small, having an actual output of from 1,000 to 10,000 board feet per day. Eleven mills are in operation at the present time, two having been installed during the year. Six other licensees are erecting mills or have ordered them. The principal markets for sawn lumber are Cebu and Tacloban, while the chief markets for ties and poles are Negros and Cebu.

Speculators in licenses have given trouble by permitting timber thieves to invoice timber under their license or by squandering the money of their financial backers. Forest charges amounting to over ₱5,600 were collected because of wasted or abandoned timber or seed trees cut contrary to instructions.

Invoices totaling ₱10,200 were prepared for timber which had been cut without license for commercial purposes.

The forests of Masbate require protection from fire and illegal clearings. To this end, it is imperative that more forest guards be assigned to Masbate, at least during the dry season. It would also be well to consider Masbate for reforestation work. Some of the forest destruction can be attributed to overzealous workers in the food campaigns, who assured the people that it was permissible to destroy commercial forests in order to raise food. During the year, 327 *kaiñgin* cases were reported, involving over 11,000 cubic meters of merchantable timber. The forest charges due are over ₱19,400. Of these cases, 120 were convicted, 7 were acquitted and the balance, 200, are still pending.

District No. 11: Headquarters, Manila.—Provinces: Bataan, Bulacan, Cavite, Pampanga, Rizal, and Zambales.

Area: 5,106.1 square miles.

Personnel: 9 rangers, 2 guard-scalers, 10 forest guards, and 1 clerk.

The chief demand for timber is in the form of piling and dugout canoes. The piling is used extensively for foundations in Manila and the canoes are sold to fishermen on Manila Bay. The lumber industry has been poor, as lumber can be bought in Manila at prices which local timber cutters do not care to meet. Firewood, on the other hand, is in great demand and all such licensees have been busy.

Where steam logging operations are being conducted, it will be necessary to attempt some form of artificial regeneration, as the cut-over areas, if left to themselves, will not produce a satisfactory forest. Reforestation work should also be undertaken on Mt. Arayat, in Bulacan, Rizal, and Zambales.

District No. 12: Headquarters, Calapan, Mindoro.—Province: Mindoro.

Area: 3,981.6 square miles.

Personnel: 5 rangers and 2 guards.

The chief timber species exported from Mindoro are guijo and kalantas, with the result that these trees are no longer found near the coast. An effort should be made to market other species, but as long as timber brokers in Manila make excessive deductions for alleged defects, refuse to pay for the entire volume of the log and by various other tactics beat down the price to the licensees, the licensees will not go to the expense and trouble of shipping other species to Manila.

The settlers from Panay, Marinduque, and Batangas are invading the forest areas. The early homsteaders, having cleared their land and being unable to keep out the grass, are using the homesteads as grazing land and are raising food crops on newly cleared forest land. The early establishment of national forests is recommended as the most effective means of keeping squatters out of the forest, or of evicting them if they enter it. In order to carry on the necessary land classification work involved in the above proposal, it will be necessary to increase the personnel of the district in order that the work may be completed within a reasonable time.

District No. 13: Headquarters, Cebu.—Provinces: Agusan, Bohol, Cebu, Leyte (western part), and Negros Oriental.

Area: 9,505.6 square miles.

Personnel: 5 rangers, 5 forest guards, and 1 clerk.

Lumbering in this district has increased because Agusan Province, which a few years ago had only a few licensees operating along the coast, now has licensees in even the most remote forests. Most of the logs from Agusan go to Manila or Cebu and the ties go to Negros and Iloilo.

Firewood continues to be in great demand and upland species, particularly ipil-ipil (*Leucaena glauca*) find a ready sale. Clear cutting is being practiced in some of the mangrove swamps and in these areas there are enough seedlings to restock the area. However, where undesirable species are left by the licensees, the better species are being crowded out. If more personnel is furnished, it will be possible to place the mangrove swamps under management and thus restore them to their former value.

About 180 kaiñgins have been inspected and complaints were filed. So far there have been 29 convictions and two acquittals. The balance, being recent cases, are still awaiting trial. It is obvious that the penalties imposed for forest destruction are not severe enough and that eviction from the land should be made a part of the sentence.

THE OFFICE OF THE WOOD EXPERT.

During this year, as in the past one, no new line of work was taken up, except the kiln-drying experiments. Two members of the wood experts staff coöperated in the Kiln-drying experiments carried on at the Q. M. C. shops and completed the last run when Messrs. Pomeroy and Connor were compelled to leave before its completion. This is discussed fully elsewhere in this report. There was a considerable increase along some lines of work; inspections of timber for local government and private use, as well as for export, were larger than in previous years

and the amount of shopwork, in the way of repairs and manufacture of office furniture, etc., was also greater.

BOTANICAL AND WOOD COLLECTIONS.

As only one minor reconnaissance project was carried out during the year, the botanical collections were less than in 1919. The number of specimens received and forwarded to the Bureau of Science was 286, of which 138 were accompanied by wood specimens. Over 200 wood samples without botanical material were received and identified; of these, 185 were of sufficient interest in connection with distribution or local names, to be incorporated in the register of trade samples. In addition to information derived from such samples, a number of new local names were taken from phenological reports.

OTHER ACCESSIONS.

Twenty-one new ten-foot planks, almost all of species new to the collection, were added during the year; of a large part of these, sufficient material was obtained to work up duplicate ten-foot planks, one surfaced and one polished, and a six-foot panel. These latter serve not only as a ready demonstration set, quickly accessible from the Director's office and other departments upstairs, but also occasionally as very convenient exhibit material for local exhibits, such as are often made at Garden Days and other local school celebrations. The total number of new six-foot planks was 29, of which part were from new material and part from seasoned material in stock, to replace as far as possible the six-foot planks destroyed in the fire at the 1920 Carnival exhibit.

Sixty new floor specimens (museum logs) were received, aggregating over 30 species, almost all new to the collection. Some of these were brought in by the Palawan reconnaissance party, some collected in the course of various minor special projects, and a few were obtained in Manila from trees thrown down by the typhoon of August 31, 1920. Among these latter were the trunks of a very large raintree (*Samanea saman*), of a narra (*Pterocarpus indicus*) and of the finest specimen of *Pithcolobium inerme* in Manila.

Beside the above material, some two or three score minor products specimens, such as rattans, resins, gums, fibers, daluru, etc., were received during the year.

To the register of foreign wood specimens, 257 numbers were added, the total being now 2,103. The old method of storing the foreign specimens in separate boxes arranged by countries

of origin, was becoming too cumbersome; an upright case was therefore constructed for storing them in more compact and accessible form, containing in a floor space of only one by four feet nearly 2,000 specimens. This is overflowing and a similar one will be built in January.

HAND SPECIMENS AND OTHER PROPAGANDA MATERIAL.

The system of furnishing additional material to forest stations has been continued as new stuff became available. About 350 additional specimens have been sent out and some 750 are at the present writing set aside for the same purpose, but have not been shipped out for lack of clerical help in listing, packing and mailing them.

Following is the complete record of all hand specimens issued:

Sold	2,243
Furnished to forest school	3,120
Furnished to forest stations	352
Distributed gratis or exchanged	3,443
Total	9,158

Beside the above, over 100 polished panels, 30 by 50 centimeters, were prepared in response to various special requests.

The specimens sold or distributed outside of the Islands went to the following countries: Australia, British North Borneo, China, Dutch East Indies, England, Germany, Hawaii, Spain, and the United States.

There were in stock at the end of the year duplicate hand-specimens for distribution of a little over 300 species.

SHOP WORK.

Beside the unusually large number of museum planks and logs prepared during the year, there were made in the shops the following articles of equipment: 18 office tables, 3 by 6 feet; 23 typewriter tables; foreign specimen case, 12 by 51 by 72 inches; 1 specimen case for office of Secretary of Agriculture and Natural Resources; 1 flat top desk for the Forest School; shelving in lower chamber of vault; over 10,000 hand specimens; about 50 scaling sticks for use at forest stations; a wood lathe attachment for the sawing and boring machine; two map cases for fire-proof vault; about 150 crates and packing cases for shipments to forest stations; additional racks in yard for storing and seasoning lumber and log specimens; preparation of the larger part of the material for two new counters in main corridor upstairs; and numerous minor jobs of making or repairing small office furniture, crating and packing, etc.

IDENTIFICATION, INSPECTION AND GRADING.

Wood specimens submitted for identification have been considered under botanical and wood collections; it may be remarked in this connection that only extremely rarely is any native wood specimen received nowadays that cannot be identified as to its family and genus. The work of identifying decayed wood specimens, for the purpose of ascertaining the hosts on which the various wood-destroying fungi thrive, has been continued, over 500 specimens being submitted this year by the mycologists, of which number about three fourths could be identified.

The members of the office inspected, for purposes of identification and grading (chiefly the former) the following:

		Bd. ft.
Piles	573	407,735
Ties	46,733	1,121,600
Lumber		304,685
Total		1,834,020

Beside these, numerous minor inspections of lots of building material, small shipments of logs, etc., were made in and about Manila, of which no detailed record of amounts and species were kept, the owners generally requiring only a superficial inspection and a general statement of the quality or kind of material involved.

Under the heading of identification comes also the revision of auxiliary invoices. About 12,000 such invoices are received annually, of which number the clerks in charge of checking them up send about one-third to the office of the wood expert for decisions in case of doubtful local names. In a very great majority of cases, it is possible now to place such names with a fair degree of certainty. Nevertheless, over 150 letters were sent during the year to licensees requesting wood specimens of species invoiced under names quite unknown, or at least unknown from the regions in which the invoices originated. In response to somewhat less than half of these letters, wood specimens have been sent in by licensees thus settling the status of the names in question.

COÖPERATION AND EDUCATION.

Beside the usual exhibit at the 1920 Carnival and Exposition, some eight or ten exhibits were made at garden days, provincial fairs, etc. A very successful extemporized erosion model was

built at the forest school on the occasion of the Annual Agricultural Exposition of the College of Agriculture in December.

Owing to the destruction by fire of the 1920 Carnival buildings, a very large part of the best specimens of gums and resins, fibers, framed herbarium sheets, forest photographs and similar minor exhibits, was lost and it has therefore been impossible to make as representative exhibits for coöperative purposes as was possible in former years.

COLLECTING AND RECORDING DATA.

Much information continues to be obtained from the checking up of auxiliary invoices already mentioned above. Herbarium and wood specimens, though not very numerous, have in a large percentage of cases given new information about distribution and local names. Also, in revising the local names in the manuscripts for the minor forest products bulletins, it has been made a regular practice, whenever a very well-known species is discussed, about the botanical status of which there can be no possible doubt, to make a systematic canvas of the whole office force and to insert in the manuscripts all the local names so ascertained. As the office staff, technical and clerical, includes natives of about two thirds of all the provinces in the islands, it is easy to see that by consulting them all about certain very familiar plants a great deal of information about distribution and local names can be obtained. The chief value of this lies in the fact that it is often the most widely distributed and familiar domestic or semi-domestic plants that are most poorly represented in the herbarium of the Bureau of Science.

In the data secured from phenological reports there has been a great falling off, as only 75 reports, containing 374 names, were received during the year.

PUBLICATION.

The task of revising the common names in the minor forest products bulletins, up to and including Bulletin 22, was completed during this year. Whenever possible, among the various names recorded for a given species, one was selected as the "official name" of the plant, with due regard to the matter of selecting what appears to be the most widely known name and, very often, of selecting one that from its meaning is more or less descriptive of or otherwise appropriate to the plant; often the uses to which a plant is put, industrial, medicinal, etc., were the deciding factor in selecting a name. Taking into account all the publications of the Bureau, nearly 800 species have now been designated by vernacular official names. It is hardly necessary to repeat that,

as far as possible, the true pronunciation of local names has been ascertained at the same time and reproduced as faithfully as may be by a simple, but fairly complete system of phonetic-spelling.

KILN-DRYING.

Early in January there arrived in Manila two men, Messers. L. K. Pomeroy and E. P. Connor, who had had extensive experience in operating the Tiemann water-spray dry kilns at the Forest Products Laboratory, Madison, Wisconsin, and had afterwards, until the end of the war, done kiln-drying work for the Army and Navy authorities in various parts of the United States.

Some time before this, the Quartermaster Corps had built a battery of three kilns in their shops which were intended to work on the water-spray system, but which, owing to lack of detailed drawing and exact specifications, had not worked properly. Arrangements were made at once for a series of coöperative tests for the benefit of the Q. M. C. and this office.

One of the kilns was remodeled under the direction of the two experts and early in March the first charge, consisting of almon (*Shorea eximia*), bagtikan (*Parashorea malaanoman*), tangile (*Shorea polysperma*), and white lauan (*Pentacme contorta*), in 1 by 12 inch boards, was put into the kiln. The average moisture content of the whole lot was 50.1 per cent. It was dried to an average moisture content of 13.8 per cent in six days. The shrinkage of seven radial and seven tangential samples was, respectively, 2.8 per cent and 4.5 per cent. In spite of the lack of various automatic controlling instruments (which there was not time to obtain from the United States) and of the men of the boiler room having shut off the steam three times during the first two days, this run was very successful. As regards some slight checks due to previous airdrying, the stock came out of the kiln in better condition than when it went in, most of the checks being completely closed up.

The second run consisted of white lauan and tangile, practically fresh from the saw. In this run it was attempted to use a more severe schedule of drying conditions, in an effort to reduce the time of drying without injuring the lumber. It was found, however, that it was too severe and the test was finally completed in the same time as the first run, six days. The white lauan was dried from 43.4 per cent to 11.1 per cent and the Tanguile from 44.6 per cent to 8.4 per cent. The condition of the lumber was not quite as good as that of Run No. 1. The drying schedule used in Run No. 1 is therefore to be recommended for the lauans.

Run No. 3 was begun immediately on the end of Run No. 2. The charge consisted of guijo (*Shorea guiso*), and yakal of several species (mostly *Shorea balangeran* and *Isoptera borneensis*, with some *Hopea* spp.; these are all woods very similar in structure and mechanical properties). The lumber was fresh from the saw, nominally 16 by 12 inches, but actually varying from $\frac{3}{4}$ to $1\frac{1}{4}$ inches. The run was begun April 29, the kiln being operated, under the supervision of the two experts, and by two members, of office of the wood expert, who had been coöperating with them in the previous runs.

Messrs. Pomeroy and Connor sailed for Europe one week after the beginning of the run and it was finished by the above-mentioned members of the Bureau.

The run was completed in 19 days. The guijo was reduced from an average moisture content of 37.3 per cent to 12.9 per cent and the yakals from 31.6 per cent to 13.9 per cent. The lumber came out in very good condition; there was no splitting except a few very fine checks at the ends of some boards and only two boards near the top of the kiln were slightly warped.

On the whole, the runs showed that, from some of the softest lauans to guijo and yakal (the latter two among the most difficult of Philippine commercial woods to season), the waterspray kiln gives very rapid and extremely satisfactory results. The military authorities were so well convinced of this by the results of the first run that they immediately gave orders to remodel the remaining two kilns in the battery.

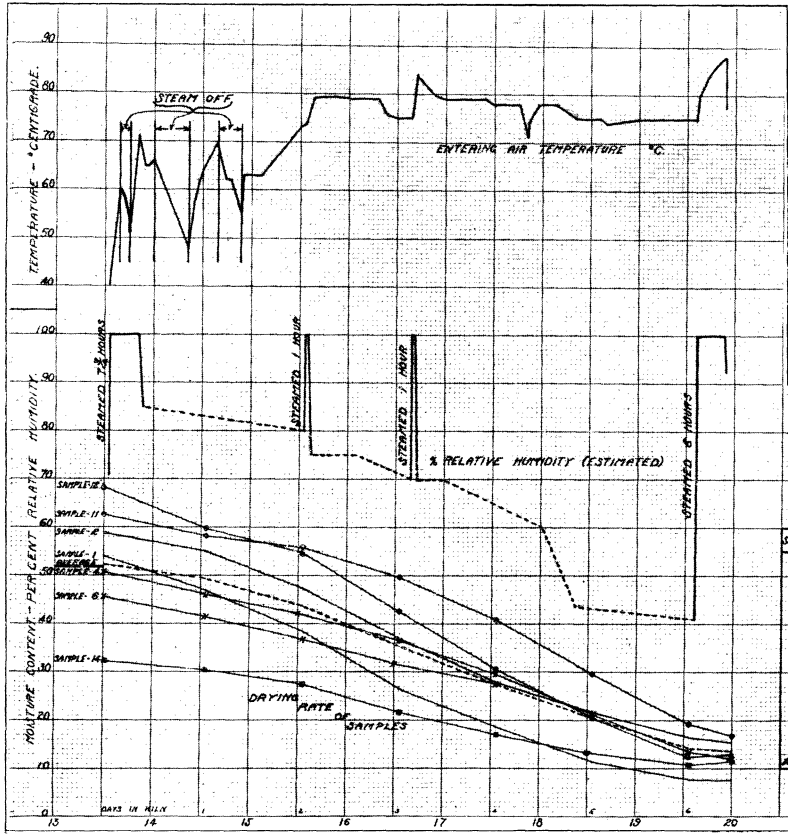
In the appendix are given diagrams and tables showing in detail the operation and results of the three runs.

DIVISION OF INVESTIGATION.

The main activity of the Division of Investigation has been centered along four lines: (1) Compilation and completion of bulletins on minor forest products; (2) the completion of the Flora of Mount Makiling; (3) Reforestation projects; and (4) Forest School.

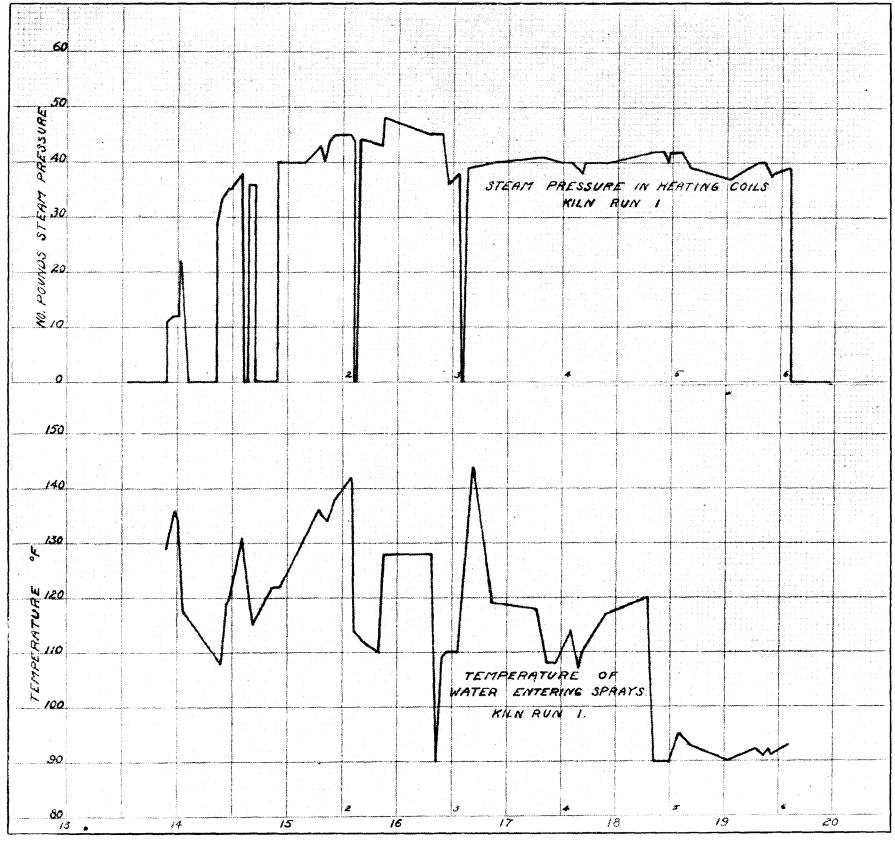
MINOR FOREST PRODUCTS BULLETINS.

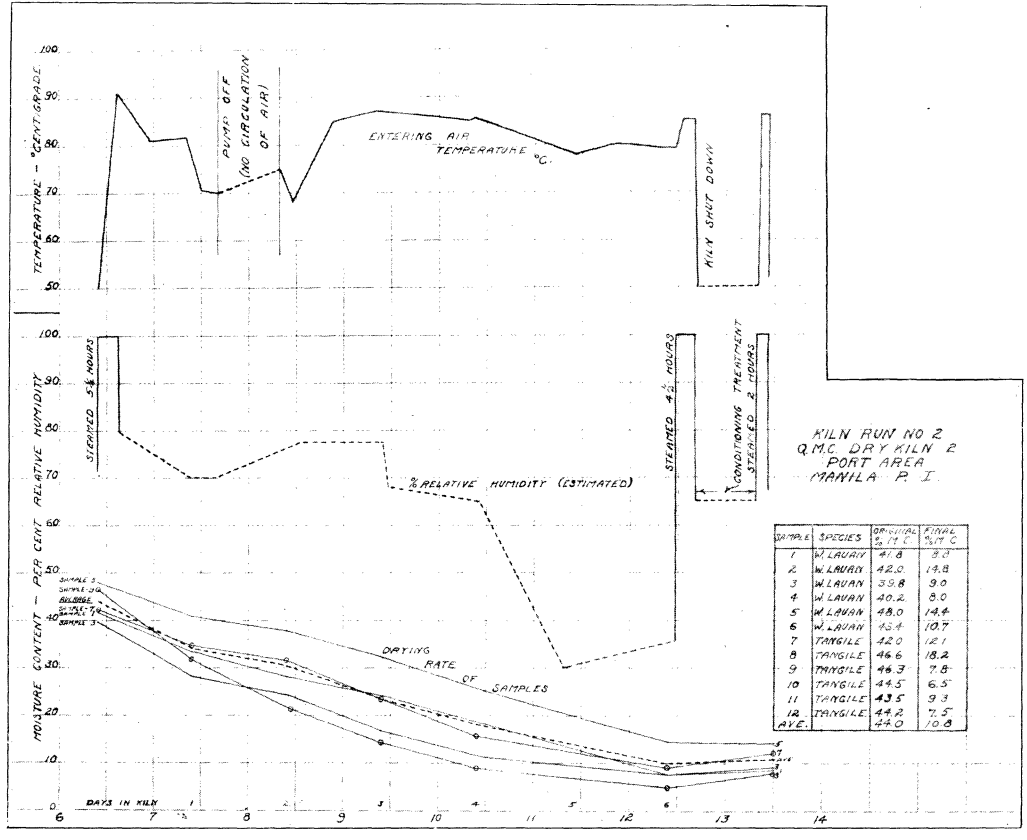
The original idea in compiling data on minor forest products was to issue as complete an account as possible of all minor forest products so arranged and indexed that any subject could be consulted either from local names, scientific names or names of products. As it was impossible to prepare the whole work at one time and as, moreover, the work naturally divided itself under certain headings, it seemed best to first issue separate



KILN RUN NO. 1
Q.M.C. DRY KILN 2
PORT AREA
MANILA P. I.

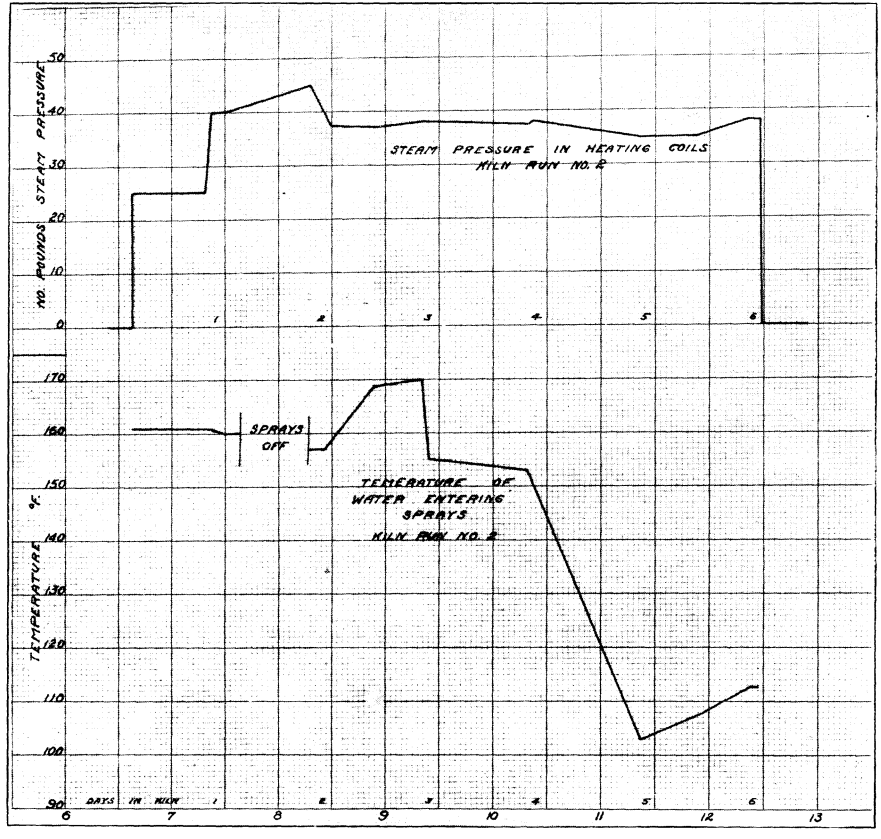
SAMPLE	SPECIES	ORIGINAL % M. C.	FINAL % M. C.
1	ALMON	54.0	7.7
2	ALMON	53.8	15.7
3	W. LAUAN	53.7	11.0
4	W. LAUAN	58.6	18.1
5	W. LAUAN	52.8	11.7
6	W. LAUAN	45.8	13.1
7	TANGILE	42.2	15.3
8	W. LAUAN	58.6	10.7
9	W. LAUAN	61.6	13.2
10	W. LAUAN	53.7	25.0
11	TANGILE	62.7	16.9
12	TANGILE	68.3	12.7
13	BAGTIKAN	31.5	17.3
14	BAGTIKAN	32.1	11.5
AVE.		52.3	13.5


LBS. POUNDS STEAM PRESSURE
60
50
40
30
20
10
0
STEAM PRESSURE IN HEATING COILS
KILN RUN 1
TEMPERATURE °F
150
140
130
120
110
100
90
80
TEMPERATURE OF
WATER ENTERING SPRAYS
KILN RUN 1.
13
14
15
16
17
18
19
20



KILN RUN NO 2
Q.M.C. DRY KILN 2
PORT AREA
MANILA P. I

SAMPLE	SPECIES	ORIGINAL % H₂O	FINAL % H₂O
1	W. LAUAN	41.8	8.3
2	W. LAUAN	42.0	19.8
3	W. LAUAN	39.8	9.0
4	W. LAUAN	40.2	8.0
5	W. LAUAN	48.0	14.4
6	W. LAUAN	43.4	10.7
7	TANGILE	42.0	12.1
8	TANGILE	46.6	18.2
9	TANGILE	46.3	7.8
10	TANGILE	44.5	6.5
11	TANGILE	43.5	9.3
12	TANGILE	44.2	7.5
AVE.		44.0	10.8

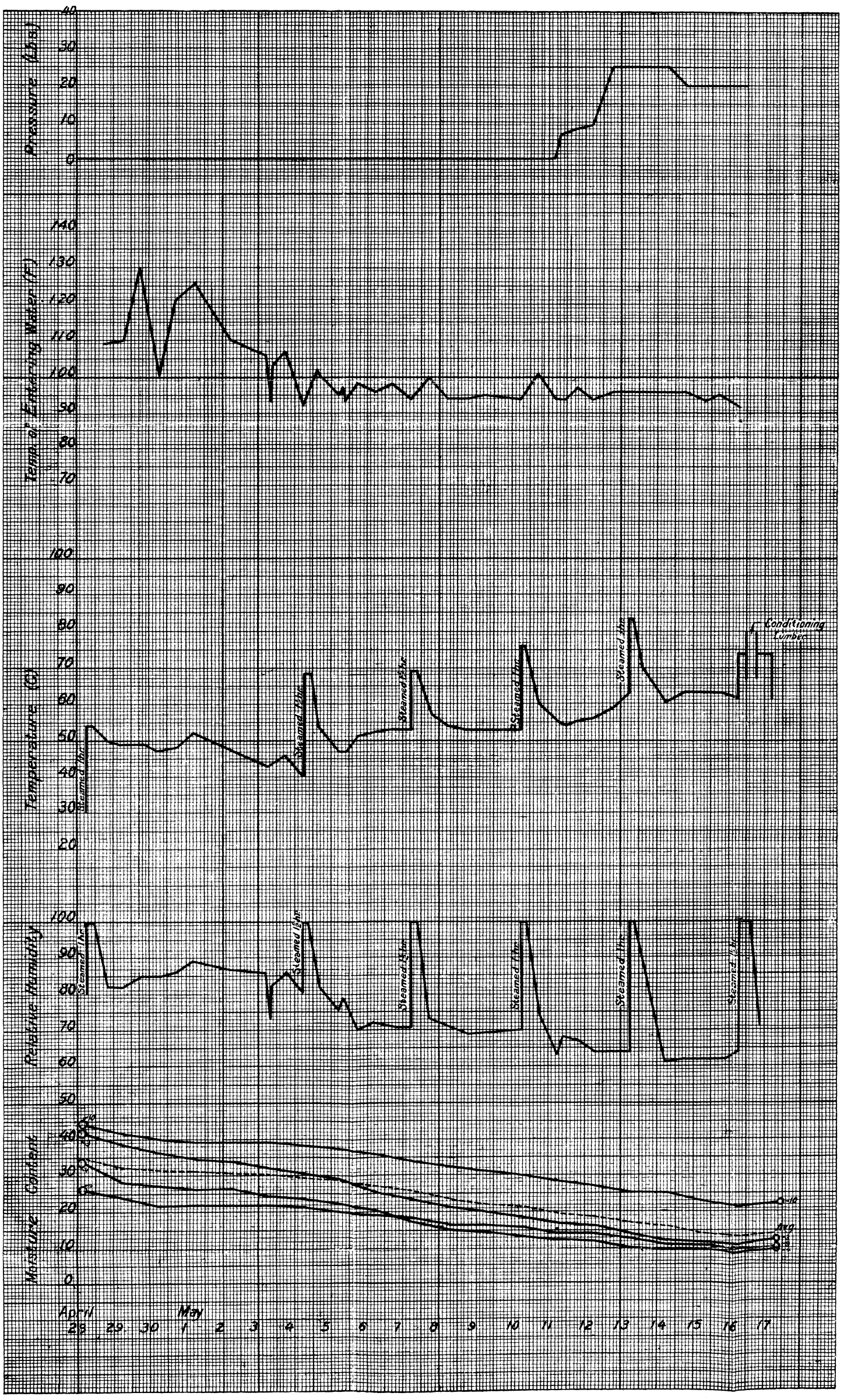

STEAM PRESSURE IN HEATING COILS
KILN RUN NO. 2
NO. POUNDS STEAM PRESSURE
50
40
30
20
10
0
1
2
3
4
5
6
SPRAYS OFF
TEMERATURE OF WATER ENTERING SPRAYS
KILN RUN NO. 2
TEMPERATURE °F.
170
160
150
140
130
120
110
100
90
DAYS IN KILN
1
2
3
4
5
6
6
7
8
9
10
11
12
13

KILN RUN No. 3

Q. M. C. Dry Kiln-2

PORT AREA
MANILA

Sample No.	Species	Original % M. C.	Final % M. C.
1	Guijo	29.9	13.7
2	"	36.8	17.4
3	"	41.2	11.0
4	"	33.8	8.7
5	"	44.6	12.5
6	Yakal	25.5	10.2
7	Guijo	37.4	14.6
9	Yakal	25.4	9.8
10	"	43.9	21.8
Avg.		35.4	13.2



bulletins dealing with various subjects and afterwards to combine these with additional material and publish the complete work. The publishing of the individual bulletins has enabled this office to make use of appropriations which were not large enough to cover the expense of the complete volume and to save the type and plates for the preparation of the complete work; also it is believed that this method will result in a considerable saving, as many people will be interested in only one section. During the year the following minor forest products bulletins have been issued:

BULLETIN 18. *Philippine Palms and Palm Products.*
BULLETIN 19. *Philippine Fiber Plants.*
BULLETIN 20. *Philippine Resins, Gums, Seed Oils, and Essential Oils.*
BULLETIN 21. *Wild Food Plants of the Philippines.*

The first volume of Bulletin 22, which is to be a complete minor forest products bulletin, has been printed. Volume 2 is in the hands of the printer and is already in page proof. Volume 3 is also in press and proof has been received for a portion of it.

SYNOPSIS OF BULLETINS ISSUED IN 1920.

BULLETIN 18. *Philippine Palms and Palm Products.*—This Bulletin contains a technical description of the palms, distribution of each species in the Philippines, a list of local names and uses of each palm. Many of these uses are of wide commercial importance, other uses are merely local and still others are important elsewhere in the East Indies, but are undeveloped in the Philippines.

Nipa (*Nipa fruticans*) furnishes thatching for houses and is the cheapest source of alcohol in the world. It grows only in tidal swamps and these are administered by the Bureau of Forestry. Extensive tracts are available on twenty-year concessions for the development of nipa swamps.

Buri (*Corypha elata*) grows in fresh water swamps and elsewhere. It furnishes fiber for certain kinds of hats. The petioles of the leaves are locally used for logging cables and tugs for carabao harness. It also produces sugar, which is so great a delicacy that but little reaches the Manila market.

Other sugar producing palms, while abundant, are scarcely utilized. The kaong or cabo negro palm (*Arenga pinnata*) is one of these. It is highly esteemed because of a black fiber which makes durable ropes for use in salt water. This fiber when used as roofing is more durable than cheap galvanized iron.

These palms and many others deserve to be widely cultivated on land not suited for agricultural crops.

BULLETIN 19. *Philippine Fiber Plants.*—There are a vast number of trees and shrubs producing fibers which are used locally for ropes. The fiber from one shrub, salago (*Wikstroemia* spp.) is highly esteemed in Japan for the excellent quality of bank note paper that it produces. There is no reason why this shurb should not be planted on a large scale on the grass covered hills of the Philippines. Other shrubs and trees have sufficient value to warrant experimental plantations being made.

BULLETIN 20. *Philippine Resins, Gums, Seed Oils, and Essential Oils.*—The resins of the Philippines come from a number of trees. Almaciga or Manila copal comes from a coniferous tree, *Aghathis alba,* and is of great commercial importance, as is also the "balau" from apitong (*Dipterocarpus* spp.) and "brea," or "Manila elemi," from the pili (*Canarium* spp.). In addition to these, various other dipterocarps contain resin and there is no reason why these trees should not be tapped a year or two ahead of logging operations.

The oil nuts of the Philippines had extensive local use before petroleum was introduced and now that the price of the petroleum is so high the villagers in remote places are turning to their ancient oil supply.

The lumbang oil industry is regaining its former importance. Since Spanish times the lumbang groves (*Aleurites moluccana*) of Cavite had been neglected, but within the last two years the demand for nuts has led to further planting of this tree.

Among the essential oils, ilang-ilang (*Canangium odoratum* Baill.) has long been exported and there is no reason why a very valuable oil should not be extracted from Aroma (*Acacia farnesiana*) which grows best in dry situations, especially on waste grass (kogon) covered hillsides.

BULLETIN 21. *Wild Food Plants of the Philippines.*—It has been said that the Filipinos had a greater variety of vegetable food than any other people. They not only have the cultivated vegetables, but they also have a large number of wild plants to draw upon. It is proverbial that a Filipino can go into any thicket and pull out a vine with which to tie up a bundle, replace a broken harness or repair a fence.

The same might be said of food plants. The leaves used for flavoring, the blossoms and young shoots that serve as salad and greens, the tubers, bulbs and roots, the ferns and fungi, the buds and pith of palms, to say nothing of wild fruits, all furnish appetizing dishes. This bulletin is a compilation of such plants and was published in order that the use of such plants

should become more general and also that unrecorded uses might be noted for possible future publications.

THE FLORA OF MOUNT MAKILING.

This work has been completed, and if sufficient funds are available, it is hoped to have it printed next year. The Flora of Mount Makiling will contain keys to and descriptions of the woody plants in the Mount Makiling region. It will be a great help to the Forest School, which has been greatly handicapped by the lack of a publication which would enable the students to identify the woody plants of the region.

DENDROLOGY.

Efforts are being made to secure as complete a herbarium as possible for the Division to aid in identifications and for use in the class in Dendrology.

The great need now is a publication describing all the important trees of the Philippine Islands with plates showing the foliage, flower and fruit of at least one species in each genus. This should be a revision of Whitford's Bulletin 10.

SILVICULTURE.

No extensive reforestation was carried on this year due to the lack of personnel and funds. However, the several projects already started have been continued.

Cebu Reforestation.—This project was begun in 1916. The area lies within the Talisay-Minglanilla Estate and comprises an area of 4,095 hectares. Practically no work has been done this year due to the lack of funds.

Considerable Ipil-ipil (*Leucaena glauca*) seed has been broadcasted and also some Lumbang (*Aleurites moluccana*) and Bagilumbang (*A. trisperma*). Seedlings of Teak (*Tectona grandis*), Narra (*Pterocarpus* spp.), Langil (*Albizzia lebbeck*), Bitaog (*Calophyllum inophyllum*), and Banalo (*Thespesia populnea*) have been planted.

Taken as a whole, the planting on this project has been a success. There has been a decided change in the attitude of the squatters on the estate toward the Bureau and its policies. At first they were hostile, but now the forest officers find little difficulty in dealing with them and securing their coöperation.

The following is a summary of the work done:

Total area planted not needing replacement	hectares....	2,545
Total expenses, June 1916 to December 1919		₱10,000
Amount of Ipil-ipil seed broadcasted	liters....	35,260

Amount of Ipil-ipil seedlings planted		115,470
Number of Bagilumbang seeds sown		802,550
Number of forest tree seedlings planted		14,800
Amount of boundary lines cleaned	kilometers	23.5
Amount of boundary lines planted		20.4
Amount of horse trail constructed	kilometers	0.915
Amount of foot trail constructed	kilometers	3.114

Ilocos Reforestation.—The reforestation work in the Ilocos provinces was inspected in August. The various projects are scattered and the great difficulty in securing quick results lies in the fact that the forest officer in charge finds trouble in properly supervising the work. This is a matter of more personnel.

The whole reforestation project in this region depends on coöperation with the inhabitants and on the protection of the areas from grazing and fire. Considerable educational and propaganda work is essential to make this a success.

Mount Arayat Reforestation.—Mount Arayat is a solitary volcanic peak rising 1,000 meters above the plains of Pampanga Province. The base of the mountain has been cleared off and brush, grass and patches of temporary cultivation occupy this region. Such land as can be placed under permanent cultivation has been homesteaded and permits are being issued to villagers in the vicinity to clear off brush, sell the firewood, raise a crop of upland rice and then plant seeds of firewood or timber producing trees. Early attempts in carrying out this plan failed, because the occupants of the land had been instigated to cook the seeds before planting them. Most of the people have a better understanding of the subject now and the areas destined for firewood production are gradually being replanted. The chief handicap is money with which to purchase seed.

The forest of Mount Arayat needs a long rest. In fact, it needs reforestation, because all of the best species have been removed and scarcely any seedlings are left. Duñgon the most sought after tree on the mountain, has disappeared and the same is true of guijo and other desirable or popular lumber trees which at one time were abundant. The only remedy is to plant desirable species, but that will take money for seed and labor. Much of the work can be done with the aid of temporary cultivators of the soil, but at best this method will be slow and irregular, because only the best patches will be reforested.

Corregidor Island Reforestation.—Upon the request of the Military authorities, two foresters were sent to Corregidor Island to inspect it and report upon the possibility of planting the bare and grassy spots upon the island. This is essentially an

Ipil-ipil proposition in the beginning, to be followed later by underplanting with timber trees. Ipil-ipil and Madre-cacao (*Gliricidia sepium*) are recommended for nurse crops with Molave (*Vitex parviflora*), Supa (*Sindora supa*), Malaruhat (*Eugenia* spp.), Narra (*Pterocarpus* spp.), Lanete (*Wrightia laniti*, Tindalo (*Pahudia rhomboidea*), Teak (*Tectona grandis*) and Raintree (*Samanea saman*), for final stand of timber. Considerable Ipil-ipil seed was gathered by the garrison at Camp Eldridge to commence this work.

Cotabato Reforestation.—This reforestation has been requested by the provincial authorities in order to eliminate the locust breeding grounds. Ipil-ipil planted in the grass lands will secure good results. Some Ipil-ipil seed has already been shipped to Cotabato, but very little work will be done in connection with this project until 1921.

Mount Makiling Reforestation (*a*) *Paliparan area.*—This area lies just back of the Military reservation (Camp Eldridge). The work was started about five years ago and the purpose of this project was to plant up grass areas, especially land occupied by kogon. The area was inspected in January and the planting found to be successful. Ipil-ipil was the main species used. It has successfully occupied the area and in two or three years the ground will be entirely covered with Ipil-ipil and the kogon crowded out. This project was more in the nature of an experiment and it was learned that the best method to use was, first, to burn over the area in the dry season to get rid of the grass and then to broadcast Ipil-ipil seed. Fire must then be kept out for at least two or three years. In two years the Ipil-ipil had reached a height of one meter. During the third year it grew beyond the kogon and if then injured by fire, the roots sent out new shoots. During the first two years, however, the seedlings will be killed if a grass fire occurs. It requires about five years for a broadcasted area to lose its kogon character. After this time a light fire might be beneficial, as it destroys the dense ground cover and Ipil-ipil seed falling from the trees will be able to germinate. Some Narra (*Pterocarpus* sp.) cuttings were also planted, but did not seem to be successful.

(*l*) *Kaiñgin Reforestation.*—This reforestation is the result of a plan inaugurated, in coöperation with the District Forester, to control kaiñgins by requiring the occupant of the land to plant forest trees. Plantings have been made by 70 kaiñgin-makers on the north side of Mount Makiling and principally in the Calamba Estate Addition. This involves an area over 37 hectares and about 9,000 trees have been set out, including the

following species: Akleng-parang (*Albizzia procera*), Bagilumbang (*Aleurites trisperma*), Kaong or Cabo negro (*Arenga pinnata*), Lumbang (*Aleurites moluccana*), Malaruhat (*Eugenia* spp.), Pugahan (*Caryota cumingii*) and Teak (*Tectona grandis*).

These areas are inspected from time to time, but the experiment has not gone far enough to justify making any conclusions.

Summary of Reforestoration.—The reforestoration work so far carried on has shown that Ipil-pil is the best species to use in most cases and especially in grass areas. It occupies the land quickly, serves as a nurse crop and in five years furnishes timber of a size sufficient for firewood. Experience has shown that fire must be kept out of a planted area for at least two or three years, otherwise no results of any value will be secured.

Reforestation is of first importance in forestry practice in the Philippine Islands and sufficient funds should be appropriated to carry on this most necessary work.

Nursery.—The nursery was moved from the old site to a site nearer the school, thus making it more accessible to the students and easier of administration. The reason for this is that it was formerly located on land belonging to the College of Agriculture, whereas today it is within the boundary of the Makiling Forest Reserve. Hectares D and F were cleared. Hectare D contains the ornamental plant beds, the nursery house, transplant beds, hot beds, etc., while Hectare F contains the student nurseries. The unoccupied area has been planted with pineapple and kamoteng-kahoy to keep out the grass and at the same time furnish the students with part of their food supply.

The cost of establishing the nursery up to date was approximately ₱1,450, including the following operations: Clearing, terracing, planting, upkeep and improvement.

The following materials is in the nursery at present:

Timber species	15,860
Palms	11,520
Cycads	800
Vines	1,640
Economic and ornamental shrubs and herbs	20,800
Total	50,620

The above figures do not include the student nurseries.

The new nursery will require a force of at least eight men to keep it in proper condition. It is one of the show spots for visitors at the Forest School. It is our aim to propagate all species of plants here that can be grown in the Philippine Islands. The greatest need at present is the installation of a

water system to enable us to carry on the work during the dry season. This will cost approximately ₱600, as over 500 meters of pipe will be required as well as the necessary fittings. More space is available in case it is desired to increase the size of the nursery. This was not possible with the former location. A deep ravine runs through the center of Hectare D; by damming and making an artificial pond here, we will be able to raise aquatic vegetation. The nursery is readily accessible from several points and trails have been built to it from several directions as well as through the various portions of the area so that all points can be reached.

Arboretum.—The arboretum was also transferred from its original site near the old nursery to a site adjacent to the new nursery. It occupies the area between the nursery and Mulauin Creek. All trees that could be moved were taken up and transferred and only the large ones were left in their original location. New plantings were made of species not represented and in a few years the new arboretum will show a large number of species both native and exotic. Cutting were made of all the species of bamboos in the old arboretum and transferred to the new site. In addition, the bamboo plantation just below the Forest School was cleaned so that it is now readily accessible.

The cost of establishing the new arboretum was about ₱560, including clearing, transplanting, upkeep and improvement.

The arboretum now contains 610 plants as follows:

Timber and fruit trees	243
Shrubs and herbs	292
Vines	45
Palms	30

Reproduction Studies.—Due to the lack of personnel and available time, the reproduction plots in the cut-over areas of the Cadwallader-Gibson Lumber Company at Limay, Bataan, established in 1913, were not inspected this year. They will be visited in January, 1921 and it is hoped that these figures can soon be compiled into a report.

Silvical Leaflets.—In connection with the class work in Silviculture, fifteen new silvical leaflets were added to the files, thus making the total number 231. These leaflets contain valuable information regarding the characteristics and habits of Philippine timber trees and will eventually form the basis for a publication on silviculture.

Seed Collection and Distribution.—Considerable seed of va-

rious tree species was collected by the students and laborers and some seed was bought. In addition small quantities were received which had been collected by the field force of the Bureau, but these did not suffice to supply the demands for seeds for planting purposes. Ipil-ipil, Lumbang, and Bagilumbang were obtained in quantity, but only small amounts of other desirable species were secured. During 1921 it is hoped to interest the field force to such an extent that we will be able to secure a sufficient amount of all species for which there is a demand.

The following quantities of tree seeds were distributed during the year:

Kind.	Destination.	Quantity (liters.)
Molave (*Vitex parviflora*)	Vigan, Ilocos Sur	3½
Narra (*Pterocarpus* sp.) and Lumbang (*Aleurites moluccana*)	New Washington, Capiz	14½
Ipil-ipil (*Leucaena glauca*)	Director of Forestry (Reforestation work)	600
Ipil-ipil	Aringay, La Union	250
Ipil-ipil	Aparri, Cagayan	60
Lumbang	Moron, Bataan	60
Madre-cacao (*Gliricidia sepium*)	Catarman, Samar	½
Anahau (*Livistona rotundifolia*)	City Nursery, Manila	20
	Total	1,008½

Plant Accessions and Distribution.—Over 120 species, mostly ornamental, were secured for the Forest Nursery from Cementerio del Norte through the coöperation of the City Nurseryman of Manila. These species were not previously represented in our nursery and they are at present being propagated to secure material for distribution.

During the year about 8,200 plants, including timber trees, ornamental trees and shrubs, were distributed from our nursery as follows:

Destination.	Number.
Laguna Schools (Arbor Day)	785
Camp Stotsenburg	5,000
Camp Eldridge	70
British North Borneo (Forest Dept.)	580
Manila (various places)	900
City Nursery, Manila	450
San Fernando, Pampanga	200
Miscellaneous	215

The increase in the size of the nursery and the extensive planting planned will enable us to take care of any reasonable demand in the future.

Plantations.—No new areas were added to the plantations during the year due to the scarcity of labor. The present area

of the plantations is 83¾ hectares. Some of the hectares established in the last few years are chocked with grass and are badly in need of cleaning, but it was impossible to have this done as the labor could not be secured, although funds were available for this work.

Cost Records.—The cost records have been kept up-to-date and figures are available, showing the cost of planting and reforestation.

Studies.—In addition to the studies mentioned under Minor Products, the Madre-cacao (*Gliricidia sepium*) planting at the Alabang Stock Farm was inspected by a ranger of this Division.

UTILIZATION.

Lumbering.—No intensive study was made in this subject this year. It is hoped in time to have all the more important logging and milling operations in the islands visited and studied. Cost figures especially are desired and in time this work would make the basis of a publication on "Lumbering in the Philippine Islands." This work can be carried out by this Division in coöperation with the Division of Sawmills and Utilization.

Minor Products (*a*) *Firewood.*—Studies were conducted by members of the division on the solid contents of a cubic meter of stacked Ipil-ipil firewood. This was done by the xylometric method and the results showed that a cubic meter contained approximately 45 per cent of solid wood. This fact is of interest and value, as studies of the same sort conducted by Raphael Zon in the United States showed an average of 75 per cent. (See Graves' Forest Mensuration, page 106.)

(*b*) *Other Products.*—The rattan forest near Cavinte, Laguna, was visited and valuation plots laid out. This is a license area and the licensee has been planting rattan. It was found that the planting of rattans for commercial purposes is practical.

The planting of Lumbang, Bagilumbang, and Gogo (*Entada phaseoloides*) in southwestern Cavite were also visited and studied and much information of value was obtained. The results of this study will be presented in a separate report.

A study of the pandan industry at Santa Cruz, Laguna, was also made.

ENGINEERING.

A comprehensive plan of engineering work has been laid out by this Division. This includes the following:

(*a*) Making a new map of the Mount Makiling Forest Reserve, showing topography, vegetative features, improvement work, etc.

(*b*) Establishment of bench marks in the plantations and on the mountain.

(*c*) Determination of the elevation of the peaks of Mount Makiling. This is to be done by differential leveling using a wye level.

(*d*) The establishment of several triangulation stations at salient points about the reserve.

(*e*) The determination of a meridian to aid the classes in surveying.

Part of this work has already been started and bench marks were set at the corners of all intersecting rides in the plantations.

The levels up the mountain have been run to the top of the first peak, the elevation of which is 1071.7 meters or approximately 3,515 feet. Bench marks have been set along the Summit trail. This trail is also equipped with guide signs and kilometer and half-kilometer posts.

A new patrol trail to the Paliparan area was laid out and is almost completed. In addition the Summit, Mud Spring and Puting-lupa trails were repaired, thus making the north side of the mountain more accessible to visitors. Several new trails are projected for 1921.

WOOD TECHNOLOGY.

(*a*) *Durability tests.*—All the woods in the durability test were taken up and examined and replaced again in the ground. This was done in September and a separate report made concerning the results.

(*b*) *Wood preservation.*—No work was done in this line due to lack of equipment and supplies. However, after the water distillation plant is erected it is hoped to install an open-tank pressure process in connection with the boiler, where woods can be treated and the results of this treatment studied. This will be of importance to wood users, especially those using ties and poles.

(*c*) *Other work.*—It is planned to increase the number of microscopic slides of Philippine woods. About 75 have been prepared, but the work has been halted due to the lack of a suitable microtome and the necessary stains. However, this equipment has been secured and the work will be resumed in 1921.

FOREST MANAGEMENT (INCLUDING MENSURATION).

(*a*) *Growth studies.*—The yearly measurement of about 590 trees comprising the eight principal species found in the Makiling Forest Reserve was taken in May. This work was started in 1913 and valuable data have already been obtained during

this time, especially figures showing the rate of growth. The measurement of every tree in the pure stand of Bagtikan (*Parashorea malaanonan*) was also continued. These, together with other growth figures taken in the plantations and elsewhere, should be available for publication in a year or so. Definite conclusions can now be drawn from these figures.

The experiment on the growth of unit areas on Mount Makiling, which was started in 1917, was also continued this year. Besides giving figures on the yield that can be expected on definite areas, this experiment will illustrate the effect of improvement cuttings on the forest.

The semi-yearly measurements of the trees in the plantations were also taken. However, it is proposed in 1921 to take these measurements only once a year due to the large size of most of the trees.

(*b*) *Working plans.*—In connection with the class in forest management, the students prepared a working plan report for the area located on Balong-Bulo, a small hill situated about two kilometers east of the Forest School and adjoining the College of Agriculture Experiment Station.

Beginning in 1921 it is planned to make a complete working plan for the Mount Makiling Forest Reserve, with a view to putting it under intensive forest management. This will require a division of the forest into blocks and an intensive reconnaissance of each block. It is expected to do a considerable part of this work in connection with the class work in forest management and engineering.

GAME.

The protection of game is rapidly becoming a feature of forestry in the United States. In Europe it has been closely allied with the profession for many generations and European foresters are well versed in this phase of the work.

Mount Makiling has a rich and varied wild life and is the only region close to Manila where these animals can be readily seen and studied by visiting scientists. There is considerable hunting on the mountain, especially of deer and wild pig. Both are rapidly becoming scarce and some measures should be taken to protect them for a time at least. The abundance of snakes in this region is said to be due to the scarcity of wild pigs. Most of the hunting is done by natives and when they can not find deer or pig, they shoot birds, which is against the law. Therefore it is recommended that some measures be taken to stop hunting. Deer should be absolutely protected and the

hunting of wild pig should be prohibited for at least two years until these animals can multiply sufficiently. A longer period than this is unnecessary and would result in the pigs becoming a nuisance.

Game protection of course involves police power and this should be granted to the foresters and rangers who are stationed here. Two or three responsible forest guards should also be given this authority.

THE WORK IN BAGUIO.

The district forester at Baguio is not only concerned with the usual administrative work of a district forest officer, but in addition is carrying on work in forest management, forest protection and reforestation. He also handles all the parks and nursery work for Baguio and vicinity.

The forest upon the public land within the Baguio Civil Reservation are being managed intensively in order to utilize to the utmost the scanty supply of timber and firewood and at the same time to retain the beauty of the pine forests for which Baguio is noted.

The miners were permitted to secure timber from other forests than those set aside for the mines in order to facilitate their operations.

All trees needed for local use or for fuel were selected for felling by a forest officer and the Christmas trees for the local trade and for the Manila market were secured in areas where their removal would do no damage.

Because of the short dry season only one serious fire occurred, but even so nearly 20,000 small trees were killed. Because of the lack of funds, no progress has been made in solving the fire problem except in and about Baguio. The number of cases of forest destruction by squatters has been reduced to almost nothing near Baguio.

The reforestation projects at the hydroelectric plant and on the head waters of Antamok Creek were inspected frequently and the results are satisfactory. The young growth however is not out of danger from fires.

The work in Baguio included the maintenance of the forest nursery and carrying on the numerous planting projects.

The pine trees have for several years produced no seed and therefore all work on pine reforestation has come to an end except for some plantings of forest grown seedlings.

The camphor seed ordered from Japan failed to arrive, but other seeds from Japan have done well. Among those imported

during 1920 are the following: *Scirpus lacustris, Castanea shibaguri, Castanea japonica, Thea sinensis, Juglans cordiformis, Zante currant, Salix multinervis, Acer atropurpureum* and *Umbellularia californica.* Among seeds received from California were the following: *Eucalyptus globulus, robusta, tereticornis, viminalis, etuartiana,* and *Chrysophyllum oliviforme.* During the year, 2,320 plants were distributed to the city and to individuals.

For private parties	728
Roads and drives	567
City parks	1,025

There are on hand 4,000 trees, 12,000 shrubs and trees and 3,000 herbacious flowering plants for use in 1921. For reforestation work, 14,570 plants were used, but most of these were intended to cover the ground and thus by killing the grass reduce the fire hazard. As a matter of fact, comparatively little tree planting has been done. The District Forester in coöperation with the Trinidad Agricultural School planted up a steep hillside containing 2.2 hectares.

Small plants were transferred from the nursery to experimental plantations, among these being 134 camphor trees.

The trees on the growth plots were measured and a new plot was laid out in the reforestation area at the Trinidad Agricultural School.

The work at the nursery is under a serious handicap because so much time is required to water the plants during the dry season. At present the water in Pacdacal Creek after rains goes to waste. Much of it could be used in the nursery if several catch basins were constructed. This work can be done at a reasonable cost and will greatly reduce nursery expenses.

An experiment was made with guano from caves in the Philippines and, as satisfactory results were obtained, it is probable that guano will be used instead of imported fertilizers.

Roads and parks.—The City of Baguio coöperated in fire protection, the city laborers being available to fight fires within the city limits. The city appropriated ₱4,500 for the maintenance of parks and for tree planting.

Burnham park was prepared as a landing place for aviators and the plants which had suffered from standing water were planted at higher elevations.

Wright park was cleaned up and the newly set out ornamentals were watered and cultivated during the dry season. It is expected that this park will require less attention in the future.

The grass in the City Cemetery was kept cut and where necessary trees were set out.

Forbes park was further beautified and a grove was fitted out for picnic parties; a wooden dam has made a swimming pool and it is evident that a concrete dam costing ₱1,000, will make a considerable pond suitable for boating and fishing.

Roadside trees were set out and looked after and special care was taken to protect young trees from damage by storms. Foot paths were constructed and several bridges were replaced or repaired and concrete or stone culverts were made where necessary.

THE FOREST SCHOOL.

The Forest School is a branch of the University of the Philippines, but, as one of its main objects is to fit young men for work in the Bureau of Forestry, the administration and maintenance of the school is assumed by this Bureau.

The Bureau of Forestry offers scholarships each year to such persons as are qualified to take the work at the Forest School. The students are selected from among energetic forest guards and from students of high schools or schools of similar rank.

The senior class of 1920 contained three Chinese students supported by a special fund in China. There were seventeen who graduated and were admitted to the Bureau of Forestry.

The class of 1922 was enrolled during the first week of April with thirty-four members. Of these, four were holding scholarships from the British North Borneo government. The number of students in this class is twenty-six at present.

The courses in botany and trigonometry were formerly given at the College of Agriculture, but as the two schools are over a kilometer apart it was decided to give all the work at the Forest School and thus save the time of the students.

The school was handicapped by the transfer of one forester to other work in the Bureau and by the resignation of two experienced rangers. A forester from the United States was assigned to the school and two field men were detailed to the school. All of these have done well.

During the year, a number of improvements were made. The arboretum and forest nursery were transferred to a site near the present school, where there was more room for expansion. Two cottages were erected and are occupied. An electric light plant has been installed, to the great benefit of the school and students.

The Bureau of Forestry telephone line was extended to the school, thus giving direct connection with the several departments of the College of Agriculture and College of Veterinary Science and also with Los Baños.

A water distillation plant is in process of erection and the trails to points of interest have been improved.

The collection of birds indigenous to the school was lost in the Carnival fire of 1920 and an effort should be made to replace the collection, as it was one of the attractions of the school. The other natural history collections are being increased by the students. Over two-thirds of the snakes found in this region have already been identified and placed on view and the insects and fish are receiving attention.

The library has been catalogued and only miscellaneous publications remain to be classified. All books and pamphlets are easily accessible to the students. The work of preparing a subject index has been commenced.

The students have been encouraged to raise their own vegetables and in addition they are also raising pigs for their own use. Their general health has been good, but four different students lost considerable time because of sickness and finally went to Manila for treatment because there are no hospital facilities for the three schools at Los Baños.

The students have taken a keen interest in forestry and whenever excursions came to the campus, the Forest School students did their part in showing the points of interest and in explaining the essentials of forestry to the visitors.

The course at the school has been revised with a view to making it as practical as possible. Furthermore, in order to secure the best possible students, members of the faculty and other forest officers visited every high school and gave talks regarding forestry as a profession.

The senior class has made two trips. One was to Mount Lobo, where the students applied their instruction in a practical manner. The other trip was to a mangrove swamp, which the class studied and mapped. Both of these trips were of great benefit to the students and the data secured will be of use to the Bureau of Forestry.

DIVISION OF SAWMILLS AND UTILIZATION.

PERSONNEL.

The large demand for lumber throughout the Philippines during the past year, together with the exceptionally high prices

prevailing, have led to a general increase in the production of existing mills, together with considerable activity among licensees in establishing mills on areas formerly devoted to logging work only. While the necessity of withdrawing all rangers that could be spared for assignment to land classification work, has prevented the increase in the ranger personnel of this Division, which would have been desirable, the system of training all the rangers graduated from the Forest School which was adopted two years ago has permitted the increase in the number of stations at which a better supervision of the scaling of logs for sawmill licensees could be carried on. With these rangers available at the different stations throughout the Islands, and the increase in the number of guard-scalers who have been appointed during the past year, the scaling work is gradually being brought to a point of efficiency which will prove more satisfactory to both the Government and the licensees in the proper measurement and manifesting of timber.

However, the solution of this problem has not as yet been reached as the Bureau has met with a very serious handicap in the matter of holding the men who have been trained as guard-scalers and who have proved efficient in the work. The training which they receive in the scaling and identification of Philippine timber and in tallying and checking lumber makes them valuable to the lumber companies, so that in several cases the Bureau has lost efficient guards through their resigning to accept more salary as checkers and scalers for the lumber companies. The importance of this scaling work, which will constantly increase in volume with the developement of the sawmill industry in the Philippines, and the necessity of holding the rangers, with their greater technical education, free for the other administrative and technical work carried on by the Bureau, makes it very important that a corps of guard-scalers be organized on a permanent Civil Service basis with salary grades and vacation privileges which will make these positions attractive to the right class of men and which will compare favorably with the salaries offered them by the lumber companies as soon as they have received their training.

At the close of this year there are 21 rangers and 24 guard-scalers doing scaling work throughout the various districts, while the installation of new mills and the increase in production of some of the old mills makes the appointment and training of 6 to 8 new guards within the next few months very necessary.

While the principle of scaling timber in the round adopted in 1915 by Act No. 2451 of the Philippine Legislature has been

generally accepted and the scaling of logs by Government scalers at the larger mills has been carried on with very few complaints during the past two or three years, the practical application of this primary business principle still leaves much to be desired, owing to the small personnel provided for carrying on the work and the comparatively low salaries paid the men employed.

The passage of Act No. 2451 was sought to protect the interest of the Government in securing the full value of the timber sold to licensees as compared with the large losses which previously were incurred when paying on the sawn product on account of the wasteful methods practiced in many of the mills. However, this law likewise placed an obligation on the Government which has not been met save in the case of larger sawmills. This obligation is contained in the provision that licensees measuring and manifesting their own logs must record and pay for full measurements and deductions for defects may only be made by the Director of Forestry or his authorized agent. As practically all timber contains more or less defects, the present shortage of scaling personnel is as unfair to the small licensees who must measure and manifest their own timber as the former system was to the Government and has simply led to false manifests in large numbers of cases where the regulations of the Bureau of Internal Revenue and the administrative personnel are unable to cope with the situation.

The most fundamental of business principles require that the Government should provide its personal representative for the supervision of the logging operations and the measurement of timber sold, both in justice to itself and to the licensee.

GRADING.

The importance of introducing a generally accepted and official set of grading rules for lumber and timber and of training a corps of men competent to perform this class of work has been repeatedly mentioned in previous annual reports, and can not be too strongly urged upon lumber manufacturers and dealers.

The exportation of lumber during 1920 has considerably increased and the future development of the industry depends very largely on the development of an export market, which in turn depends on the shipment of standard, reliable grades of lumber. An indication of the damage which may be done to the export trade in lumber is contained in the reports published in the local press at the close of the year of shipments of Philippine lumber lying on the docks in San Francisco and Seattle with no buyers because of its poor condition and in unofficial inspections. by

members of this Bureau, of shipments to the United States in which six or more lower group species of poor quality were substituted in part for the two species specified by the purchaser. The continuation of such practices as this can only result in the establishment of a bad name for Philippine lumber in the countries to which it is shipped, which will require much time and trouble to overcome, and it is again urgently recommended that the local lumbermen combine to establish definite rules under which all foreign shipments of lumber shall be made.

The further training of Government inspectors has had to be abandoned during the past year and there is no prospect at present for resuming it during the coming year, owing to the large amount of pending work and the small personnel provided. Numerous requests for inspections have been complied with by members of the Office of the Wood Expert, but such inspections have been necessarily confined almost exclusively to identification of species and a general statement of the merchantable character of the lumber, with no effort to grade as to quality as is the common practice in the United States.

LUMBERING.

The continued growth of the local lumber trade, together with the increase in the export market during the past year, had produced, until the general cessation in all lines caused by the financial stringency of the last few months of the year, almost unprecedented prices for lumber and a demand for license areas greater than the forest areas commercially available could accommodate. This has in turn greatly stimulated the interest of small licensees in the installation of sawmills, so that all machinery available locally has been put to work and new mills ordered from the United States by licensees anxious to secure their share of the active and profitable market which has prevailed during the greater part of the year. Newly installed mills have started operations on the areas of the following licensees; Zambales Lumber Company, Northern Luzon Lumber Company, Ruiz y Rementeria, Flecha Point Lumber Company, W. L. Lamb, A. Bleivel, I. Rosales and N. O. del Pilar, while the old Taba Bay Sawmill resumed operations in February under the direction of the Hercules Lumber Co.

Sawmills are also ordered or under installation by the Agusan Timber Company, Rosenstock, Wrentmore and Reynolds, P. Chavez, E. A. Gebert, F. L. Evangelista, Albert Bryan, Lucanin Plantation Co. and licensees in Bagac, Bataan and Subic, Zambales.

While it is believed that the reaction in the lumber market being experienced during the last two months of the year is entirely due to a temporary fluctuation resulting from the financial crisis, and that the timber market will return to approximately its previous activity and level of prices, it is believed that the large number of licensees, unfamiliar with efficient methods of logging and sawmill operation, who are rushing into the business without competent managers or sufficient capital resources, will cause many failures as soon as the prevailing heavy demand is taken care of and the purchasers become more particular and exacting in their demands for a better grade of lumber.

The shortage of personnel already noted has made it impossible to keep up to date records of the production of all the sawmills distinct from the production of the smaller licensees operating without mills, while reports requested from the millmen themselves are so delayed and incomplete as to make it impossible to include the data in this report.

Reports available from 18 companies show the following production figures:

Year.	Log scale.	Mill tally.	Sales.	Forest charges.
	Cubic meter.	*Cubic meter.*	*Cubic meter.*	*Pesos.*
1919	285,729.32	202,066.81	191,390.07	243,563.37
1920	306,837.15	215,515.54	216,584.78	262,747.78

While production as a whole has increased during 1920, this increase has been largely due to the preparedness of a few of the largest mills and to the increased activities of the smaller mills induced by the boom in the lumber business. Many of the older mills however have shown a sharp decline in the amount cut during 1920 as compared with the previous year, due to a number of reasons. The large amount of coast line found in the Philippines, much of which is forested, has until the last few years permitted a large amount of logging with the simplest possible methods, which created an unwarranted dependence on this type of logging by many operators, the majority of whom were almost totally unfamiliar with modern methods of animal and mechanical logging and who were very loath to make the investment necessary for the installation of such methods as would permit the development of areas further in from the coast, which could not be profitably reached by the simple animal and hand logging methods in use. With the general improvement in the lumber market which started in 1916, came also

the large increase in the cost of all machinery and supplies, which brought further hesitation on the part of these mill owners to invest in the machinery necessary for the further development of their areas, with the result that during the past year the majority of these licensees have not only been unable to increase their output, but in the majority of cases have fallen behind their production of previous years owing to inability to supply their mills with sufficient logs. Decreases in the log scale at these mills have run as high as 1,200 to 4,000 cubic meters for the year.

LOCAL MARKETS.

As noted in the annual reports for the past three years, the large amount of local development work in sugar, coconut oil and other industries and in public works development has furnished a very active local market for timber and has absorbed from 85 per cent to 90 per cent of the total production in addition to imports slightly in excess of one half the amount exported.

The following tables made up from reports receive from the mills at which forest officers are stationed, shows by principal species and ports, the distribution of the lumber sold by the larger and more active companies operating in the Philippines.

Lumber shipment by seventeen lumber companies, January 1 to December 31, 1919.

Destination.	Red Lauan and Tangile.	White Lauan.	Apitong.	Guijo.	Mangachapuy.	Lumbayao.	Yacal.	Palosapis.	Miscellaneous.				Total.
									First group.	Second group.	Third group.	Fourth group.	
United States	1,826,222	1,951,969	763										3,778,954
Hongkong		447,822							3,025				450,847
Shanghai	882,331	1,125,848	75,516			27,354						69,633	2,180,682
Manila	3,346,899	13,793,392	7,361,583	1,675,848	65,842	1,299,844	1,261,086	750,774				5,204,553	34,759,821
Luzon Ports	6,216	4,635	168,931	18,385			15,786	22,248				61,949	298,150
Cebu	825,920	1,661,958	1,130,530	172,487	24,713	264,931	184,513					496,192	4,761,244
Iloilo	196,352	795,308	143,508	15,013	3,743	22,474	1,295					46,261	1,223,954
Visayan Ports	659,477	143,781	40,771	5,899		15,958	40,080					3,807,206	4,713,172
Zamboanga	26,133	640,027	258,845	178,570	11,454	586,416	197,781					172,628	2,071,854
Davao		176,186	50,136	90,072	2,167	96,130	53,803					198,846	667,340
Mindanao and Sulu Ports	245,205	1,399,799	570,120	147,110	21,913	335,567	139,021					139,123	2,997,858
Unclassified Ports	7,610,221	8,734,248	2,082,216						67,878	108,086	2,102,588	1,781,223	22,486,460
Grand total	15,624,976	30,874,973	11,882,919	2,303,384	129,832	2,648,674	1,893,365	773,022	70,903	108,086	2,102,588	11,977,614	80,390,336
Mill tally	24,916,216	26,414,340	12,773,500	3,469,346	551,492	2,286,615	2,365,462	788,487	81,628	159,733	2,320,060	7,217,901	83,345,231

Lumber shipment by seventeen lumber companies, January 1 to December 31, 1920.

Destination.	Red Lauan and Tangile.	White Lauan.	Apitong.	Guijo.	Mangachapuy.	Lumbayao.	Yacal.	Palosapis.	Miscellaneous.				Total.
									First group.	Second group.	Third group.	Fourth group.	
United States	3,942,736	1,922,384	187,826	.....	.....	559	.....	.....	.....	.....	.....	15,094	6,068,599
Africa	11,087	13,601	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24,688
Shanghai	876,564	425,466	130	.....	.....	.....	.....	.....	.....	.....	.....	4,103	1,306,263
Hongkong	.....	212,227	.....	.....	.....	.....	.....	.....	11,293	.....	.....	.....	223,520
Manila	11,513,150	18,654,788	12,509,460	1,657,812	120,169	1,221,501	1,488,887	646,415	683,020	11,584	430,494	3,999,217	52,836,497
Luzon Ports	157,049	279,329	454,964	47,851	1,249	.....	4,186	56,360	14,716	1,977	1,006,722	161,286	2,185,689
Cebu	934,222	573,754	689,299	108,929	28,290	206,812	69,535	.....	4,569	7,294	34,642	389,840	3,047,186
Iloilo	483,751	298,828	74,265	7,348	592	.....	578	.....	.....	.....	.....	103,840	969,202
Visayan Ports	1,173,263	504,039	395,406	9,293	.....	23,195	1,245	471	.....	.....	1,866,587	105,383	4,078,882
Zamboanga	125,503	493,081	274,284	89,197	19,560	438,333	54,567	.....	9,096	51,736	54,763	200,673	1,810,793
Davao	50,998	95,000	814	1,641	.....	1,815	30	.....	136	.....	.....	115,146	265,580
Mindanao and Sulu Ports	650,131	665,801	502,845	103,558	37,187	180,374	41,109	14,735	5,978	4,754	947	255,766	2,463,185
Unclassified Ports	5,324,259	6,035,708	1,709,329	9,222	3,526	27,668	4,069	.....	5,154	.....	.....	1,085	13,120,020
Grand total	25,242,713	30,174,006	16,798,622	2,034,851	210,573	2,100,257	1,664,206	717,981	733,962	77,345	3,394,155	5,251,433	88,400,104
Mill tally	26,441,950	27,701,090	19,786,494	3,057,913	359,756	1,978,647	1,888,712	1,169,201	899,385	539,633	3,147,852	2,967,975	89,938,608

FOREIGN MARKETS.

While local markets have been the principal buyers of the lumber so far produced in the Philippines and will undoubtedly continue to absorb large quantities, a continuation of the present development of the lumber industry and a development on the scale warranted by the resources of Philippine forests will depend very largely on the better development of export markets. Although shipping and general trade conditions brought about by the European War greatly interfered with foreign shipments of lumber during the past five or six years, it is believed that too little attention has been paid to the possibility of developing these markets and too much reliance has been placed on the local trade, so that local depressions in the lumber market have had an unwarranted reaction on the lumber companies. An illustration of this is contained in the recent financial stringency which has brought considerable depression in the lumber market. Almost simultaneously this office received several inquiries from foreign sources as to possibilities of securing large quantities of timber which were referred to local lumbermen.

However, little response has been received to these inquiries owing to the fact that the few companies which have done anything in the export line already had sufficient orders for their export trades and the remainder were unprepared to handle this business.

The substitution of Philippine lauans and tangile on the American market for the diminishing supply of true mahogany has been going on for some years past and deserves to be established, with proper advertising, on its own merits rather than as a substitute for a totally different species.

With reference to the China market, an article in a recent number of the *West Coast Lumberman* states:

> China imports annually from 2,000,000 to 4,000,000 cubic feet of hardwood, chiefly through the leading import centers of Shanghai and Tientsin.
>
> During the three months period from January to March, 1920, Shanghai imported 217,174 cubic feet of hardwood * * * Singapore, Japan, and South America, in the order named, dominated the trade.
>
> Tientsin is a growing center for trade in lumber. Tientsin's timber imports (hardwood) during 1919 were 837,959 cubic feet of rough, hewn and sawn material. From January 1 to April 17, 1920, Tientsin imported 37,050 superficial feet of rough hardwood * * * Hankow is also an important and growing center for lumber imports. More than 4,000,000 square feet of softwood, 78,000 cubic feet of hardwood, and 339,000 sleepers were imported in 1918 * * *

China's imports of timber come chiefly from the United States, Japan, Canada, Norway, Singapore, India, Indo-China, and the Dutch East Indies. During the war, Philippine lumber obtained a foothold in China's markets.

Philippine lumber has been known on the China market for a very long time. As a matter of historical interest, Chinese records a thousand years old speak of importations of timber from the Philippines. And with the constantly growing demand for lumber which the prospective and actual development of China indicates, the active participation of Philippine lumber in this market seems only dependent on the activity of local lumbermen in developing the trade.

The following tables show the total exports and imports of lumber and timber through Philippine ports during the past three years, by principal species and countries of origin and destination.

Lumber and timber exported from the Philippine Islands.

	1920			1919			1918		
	Cubic meter.	Board feet.	Value.	Cubic meter.	Board feet.	Value.	Cubic meter.	Board feet.	Value.
United States:									
Tangile timber							31	13,144	₱1,015
Narra lumber				?		₱50			
Tangile lumber	6,875	2,915,000	₱557,388	3,515	1,490,360	260,207	3,268	1,385,632	229,494
Almon lumber	1,892	802,208	111,877	459	194,616	18,504	1,056	447,744	35,450
Lauan lumber	10,014	4,245,936	446,879						
Miscellaneous lumber	43	18,232	3,077	4,836	2,050,464	251,840	2,656	1,126,144	117,679
Total	18,824	7,981,376	1,119,221	8,810	3,735,440	530,601	7,011	2,972,664	383,638
To Hongkong:									
Miscellaneous timber	48	20,352	1,000	252	106,848	5,912	168	71,232	10,815
Narra lumber							1	424	163
Almon lumber	88	37,312	2,436				2,693	1,141,832	42,787
Lauan lumber	501	212,424	19,169						
Miscellaneous lumber	416	176,384	37,324	1,278	541,872	52,572	1,165	493,960	37,279
Total	1,053	446,472	59,929	1,530	648,720	58,484	4,027	1,707,448	91,044
To China:									
Narra timber				3	1,272	360			
Miscellaneous timber	1	424	250	43	18,232	5,050			
Narra lumber							10	4,240	1,032
Tangile lumber	24	10,176	3,714	535	226,840	17,890	8	3,392	395
Almon lumber							10	4,240	993
Lauan lumber	5,900	2,501,600	247,608						
Miscellaneous lumber	2,361	1,001,064	103,698	4,111	1,743,064	147,139	5,457	2,313,768	163,809
Total	8,286	3,513,264	355,270	4,692	1,989,408	170,439	5,485	2,325,640	166,229
To Japan:									
Narra timber	1	424	150						
Miscellaneous timber	21	8,904	4,118	90	38,160	1,982			
Narra lumber	?		11			100			
Tangile lumber				5	2,120	500	7	2,968	1,130
Almon lumber				?			?		20
Miscellaneous lumber	15	6,360	5,582	7	2,968	1,146	4	1,696	753
Total	37	15,688	9,861	102	43,248	3,728	11	4,664	1,903

Lumber and timber exported from the Philippine Islands—Continued.

	1920			1919			1918		
	Cubic meter.	Board feet.	Value.	Cubic meter.	Board feet.	Value.	Cubic meter.	Board feet.	Value.
To Australia:	117	49,608	₱10,301	22	9,328	₱1,677	4	1,696	₱174
Tangile lumber	1,102	467,248	57,285	446	189,104	18,812			
Almon lumber	480	203,520	25,850						
Lauan lumber				99	41,976	6,296	9	3,816	252
Miscellaneous									
Total	1,699	720,376	93,436	567	240,408	26,785	13	5,512	426
To United Kingdom:	1	424	192						
Narra lumber	793	336,232	58,764						
Tangile lumber	1,168	495,232	76,913						
Lauan lumber	459	194,616	34,777						
Miscellaneous lumber									
Total	2,421	1,026,504	170,646						
To Canada:	94	39,856	6,000						
Almon lumber	203	86,072	12,538						
Lauan lumber				362	153,488	14,964			
Miscellaneous lumber									
Total	297	125,928	18,538	362	153,488	14,964			
To British East Indies:	7	2,968	720	2	848	300			
Miscellaneous timber	13	5,512	1,711						
Miscellaneous lumber									
Total	20	8,480	2,431	2	848	300			
To British Africa:	46	19,504	3,000						
Lauan lumber									
To Dutch East Indies:				4	1,696	126			
Miscellaneous lumber									
To Guam:	10	4,240	1,000						
Lauan lumber							9	3,816	680
Tangile lumber							143	60,632	6,876
Miscellaneous lumber									
Total	10	4,240	1,000				152	64,448	7,556

To Spain:									
Narra lumber	1	424	550						
Miscellaneous lumber			415						
Total	1	424	965						
To all countries:									
Narra timber	1	424	150	3	1,272	360			
Tangile timber							31	13,144	1,015
Miscellaneous timber	77	32,648	6,088	387	164,088	13,244	168	71,232	10,815
Total timber	78	33,072	6,238	390	165,360	13,604	199	84,376	11,830
Narra lumber	2	848	753			150	11	4,664	1,195
Tangile lumber	7,809	3,311,016	630,167	4,077	1,728,648	280,274	3,296	1,397,504	231,873
Almon lumber	3,176	1,346,624	177,598	905	383,720	37,316	3,759	1,593,816	79,250
Lauan lumber	18,322	7,768,528	832,957						
Miscellaneous lumber	3,307	1,402,168	186,584	10,697	4,535,528	474,083	9,434	4,000,016	326,648
Total lumber	32,616	13,829,184	1,828,059	15,679	6,647,896	791,823	16,500	6,996,000	638,966
Grand total	32,694	13,862,256	1,834,297	16,069	6,813,256	805,427	16,699	7,080,376	650,796

Lumber and timber imports into the Philippine Islands.

	1920			1919			1918		
	Cubic meter.	Board feet.	Value.	Cubic meter.	Board feet.	Value.	Cubic meter.	Board feet.	Value.
From United States:									
Cedar timber				389	164,936	₱5,924			
Ties							1,305		₱659
Miscellaneous timber	121	51,304	₱2,149	36	15,264	2,670	96	40,704	4,900
Pine lumber	2,545	1,079,080	110,172	4,612	1,955,488	247,345	6,235	2,643,640	202,008
Redwood lumber	851	360,824	55,185	871	369,304	30,833	1,294	548,656	37,210
Cedar lumber	270	114,480	11,164	37	15,688	2,355	499	211,576	7,223
Cedar box shooks									64,383
Miscellaneous lumber	9,687	4,107,288	451,662	6,657	2,822,568	242,285	4,088	1,733,312	117,084
Total	13,474	5,712,976	630,332	12,602	5,343,248	531,412	12,212	5,177,888	432,808
From Canada:									
Miscellaneous timber	69	29,256	1,743				7	2,968	680
Pine lumber	358	151,792	10,409						
Miscellaneous lumber	3,231	1,369,944	82,147	1,062	450,288	43,719	742	314,608	16,357
Total	3,658	1,550,992	94,299	1,062	450,288	43,719	749	317,576	17,037
From Hongkong:									
Miscellaneous timber	6	2,544	237						
Cedar lumber	614	260,336	12,283						
Total	620	262,880	12,520						
From China:									
Miscellaneous timber	2	848	22	3	1,272	53	20	8,480	233
Miscellaneous lumber	142	60,208	4,044	29	12,296	510	50	21,200	724
Total	144	61,056	4,066	32	13,568	563	70	29,680	957
From Japan:									
Cedar timber							25	10,600	985
Cedar box shooks									3,889
Pine lumber							17	7,208	608
Miscellaneous lumber			4	30	12,720	212	20	8,480	150
Total			4	30	12,720	212	62	26,288	5,632

From British East Indies:									
Miscellaneous timber	111	47,064	1,516	44	18,656	1,339			
Miscellaneous lumber	435	184,440	16,063	343	145,432	13,923	150	63,600	4,307
Total	546	231,504	17,579	387	164,088	15,362	150	63,600	4,307
From British West Indies:									
Miscellaneous timber							1,664		2,147
From French East Indies:									
Miscellaneous timber				3	1,272	96			
Miscellaneous lumber	13	5,512	32	7	2,968	239	26	11,024	752
Total	13	5,512	32	10	4,240	335	26	11,024	752
From Guam:									
Miscellaneous lumber	2	848	200						
From Spain:									
Cedar box shooks									1,738
Miscellaneous lumber	31	13,144	1,302						
Total	31	13,144	1,302						1,738
From Netherlands:									
Cedar box shooks			1,596						
From Dutch East Indies:									
Cedar timber							50	21,200	1,137
From Germany:									
Miscellaneous timber							20	8,480	1,589
Pine lumber							2	848	15
Miscellaneous lumber				29	12,296	556			
Total				29	12,296	556	22	9,328	1,604
All countries:									
Cedar timber				389	164,936	5,924	75	31,800	2,122
Miscellaneous timber	309	131,016	5,667	86	36,464	4,158	1,807	766,168	9,549
Cedar lumber and box shooks	884	374,816	25,043	37	15,688	2,355	499	211,576	77,233
Pine lumber	2,903	1,230,872	120,581	4,612	1,955,488	247,345	6,254	2,751,696	202,631
Redwood lumber	851	360,824	55,185	871	369,304	30,833	1,294	548,656	37,210
Miscellaneous lumber	13,541	5,741,384	555,454	8,157	3,500,968	301,444	5,076	2,152,224	139,374
Total	18,488	7,838,912	761,930	14,152	6,000,448	592,059	15,005	6,362,120	468,119

DIVISION OF FOREST LANDS AND MAPS.

SECTION OF PUBLIC FOREST LANDS CASES.

The same difficulties encountered in former years have been observed in handling the cases pertaining to this section. Some of these difficulties may be obviated by establishing a more effective coöperation between this Bureau and the Bureau of Justice.

The following table shows the status of the claims received during 1920:

G. L. R. O.	Number received.	Action.	Opposition withdrawn after inspection.	Pending decision of court.	Number of hectares adjudicated to the Insular Government.	Remarks.
Cadastral	6	1	.....	1	.....	.....
Ordinary	2,452	50	23	25	8.47	1 lost in court.
Total	2,458	51	23	26	8.47	.....

One case was lost because the ranger who examined the land was in the field and could not be reached before the hearing was over. In the case which was won over eight hectares of mangrove swamp were declared public land.

SECTION OF PRIVATE FOREST LANDS REGISTRY.

Forty-one parcels of land with a total area of 47,723 hectares, 82 ares, and 90 centares have been registered in accordance with the provisions of section 1829 of the Administrative Code, and examined for the information of the Collector of Internal Revenue. The decrease of the number of parcels registered during this year as compared with that of last year is due to a great number of applications rejected for registration for lack of proper documents or because the boundaries are too indefinite to be located on the ground. The latter case, when conflicts and friction between licensees of the Bureau of Forestry and the claimants have taken place, involves questions of fact which are more or less difficult to decide.

In rejecting an application, if the land, because of the condition of its soil and slight value of its forest products, is more valuable for agricultural than for forest purposes, the claimant is advised to perfect his title in the court and is informed that in the mean time, the land is considered as an unregistered private woodland and that the utilization of forest products found thereon will be governed by section 1513 of the Administrative Code; if the land or portion of it is more valuable for forest than for agricultural purposes, the claimant is informed that the whole area or portion of it is considered as a part of the

public forest until he has perfected his claim in the court and that the forest products found thereon will be disposed of by the Bureau in accordance with the forest laws and regulations. Also, he is warned not to cut or remove any forest products or clear any portion of the forested portion without first securing a proper license or permit from the Director of Forestry. But since the latter procedure has no legal force, to protect the rights and business of a licensee operating in an area considered by the Bureau of Forestry as part of the public forest, the legislation recommended last year, authorizing the Director of Forestry to settle the questions of fact, which settlement, once approved by the Department Secretary, shall be final so long as the Court of Land Registration, on request by the claimant, might not decide the question, is now again recommend for the good of the public in general and for the interest of efficient administration in particular.

The following table shows the private woodlands registered up to December 31, 1920:

Registered private woodlands.

Calendar year.	Number of—			
	Parcels.	Hectares.	Ares.	Centares.
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,215	86	62
1910	4	8,653	85	22
1911	5	5,533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
1917	48	7,985	68	39
1918	84	43,213	17	26
1919	110	14,943	71	39
1920	41	47,723	82	90
Total	1,141	428,474	66	88

SECTION OF PUBLIC LANDS APPLICATION.

The provisions of the new Land Law have caused a radical change in the procedure in vogue for classifying lands. Formerly it was customary to examine parcels of land applied for by individuals. This was done in connection with other work of rangers or when other equally important forest work permitted. The time of the field men was occupied with a multitude of small parcels. Now it has been necessary to detail a large body of specially trained men for the sole work of examining and class-

ifying lands into forest zones and areas that may be alienated at the request of the Director of Lands. The importance of this work and its future potentialities necessitate that this classification of land must be made by men of training and experience. The result has been to strip forest stations of the most competent men, leaving in their place temporary forest guards who could at least patrol the forest and thus detect or prevent violations of the Forest Laws. The forest officers drawn from all districts, were organized into parties and they have examined, since last August, 182,982 hectares of public land which may be alienated, in the following provinces:

	Hectares.
Camarines Norte	9,000
Camarines Sur	33,809
Cotabato	1,024
Lanao	1,024
Leyte	17,124
Mindoro	45,579
Negros Occidental	40,320
Nueva Esija	12,580
Pangasinan	496
Sorsogon	18,640
Tayabas	1,024
Bataan	2,362
Total	182,982

In addition, the following individual applications for public lands were acted upon:

Summary of Table I, appendix.

Pending on December 31, 1919	4,823
Received during 1920	1,191
Total	6,014
Certified to the Bureau of Lands for agriculture	2,356
Certified to the Bureau of Lands for forestry	436
Returned to the Bureau of Lands without certification	380
Total	3,172
Pending on December 31, 1920	2,842

SECTIONS OF FOREST ZONES, RESERVES AND COMMUNAL FORESTS.

Salinas Forest Reserve.—The Salinas Forest Reservation was proclaimed by Executive Order No. 44 on May 18, 1914, for the purpose of protecting the famous salt spring of Salinas, Nueva Vizcaya.

The reserve is managed by the provincial governor, who supervises the manufacture of salt. The province has put in evaporating kettles which are leased to professional salt makers and to individuals who come there in large number for their annual salt supply.

Each person gets firewood wherever it is most convenient, and, as a result, the fuel around the salt works is disappearing rapidly. It is probable that the natural supply would be equal to the demand if it were not for the grass fires. The kogon hills are burned off once or twice a year and as a result no shrubs can survive.

A former attempt to plant firewood trees failed because of the fires, and all future attempts will also fail unless fires are prevented. The planting of firewood species, namely Ipil-ipil (*Leucaena glauca*) and Madre-cacao (*Gliricidia sepium*), will be of great benefit and this work must be undertaken soon, or else the cost of the production of salt will become excessive owing to the expense of fuel. The planting of these trees passed the experimental state years ago, and nothing will prevent the establishment of firewood areas at Salinas, except the lack of funds to do the work and to protect the plantation from fire for three or four years.

Makiling Forest Reserve.—This reserve was created on November 21, 1910 by Proclamation No. 106 of the Governor-General of that year with the double purpose of making silvicultural studies and experiments, and for the establishment of the Forest School. On November 30, 1920, the Makiling Forest Reserve was abolished by Proclamation No. 60 and made "The Makiling National Botanical Garden." The abolition of the Forest Reserve does not in any way effect the purpose for which it was created, for the Bureau of Forestry has a joint control of the management and beautification of the garden.

Communal Forests.—In accordance with the provision of the law, 69 parcels with a total area of 9,009 hectares have been located, studied and designated as communal forests.

The following tables show the total number of communal forests established up to December 31, 1920, and their distribution by provinces:

Commercial forests established from 1908 to 1920.

Year.	Parcels.	Hectares.
1908	19	5,326.00
1909	19	6,609.00
1910	19	5,796.00
1911	53	15,147.60
1912	59	10,957.00
1913	26	3,387.00
1914	45	6,860.00
1915	90	12,129.00
1916	110	15,862.00
1917	83	10,110.00
1918	61	7,704.82
1919	63	10,537.35
1920	69	9,008.85
Total	716	119,454.62

Statement of communal forests established up to December, 1920.

Provinces.	Parcels established.		Total parcels established up to 1920.	Municipalities, rancherias or townships.			Cancelled.	
	Before 1920.	During 1920.		With C. F.	Without C. F.	Area in hectares of parcels established up to 1920.	Parcels.	Hectares.
Abra	26	1	27	15	23	5,448.00	.....	.....
Albay-Catanduanes	12	4	16	11	13	1,819.00	.....	.....
Antique	4	.....	4	4	10	934.00	.....	.....
Bataan	15	1	16	12	.....	4,791.40	2	464.00
Batanes	.....	.....	.....	.....	6	.....	.....	.....
Batangas	1	1	2	1	23	136.00	.....	.....
Bohol	31	2	33	22	14	3,792.80	.....	.....
Bulacan	2	.....	2	2	22	340.16	1	232.16
Cagayan	34	3	37	20	4	4,439.60	1	66.00
Camarines Norte	8	.....	8	7	2	1,171.00	.....	.....
Camarines Sur	32	2	34	24	7	4,006.50	.....	.....
Capiz	21	2	23	11	6	2,984.00	.....	.....
Cavite	.....	.....	.....	.....	20	.....	.....	.....
Cebu	10	.....	10	7	43	1,175.00	.....	.....
Ilocos Norte	20	2	22	15	15	7,269.00	4	1,127.00
Ilocos Sur	21	3	24	21	17	8,278.00	.....	.....
Iloilo	10	4	14	7	23	1,817.00	.....	.....
Isabela	18	1	19	13	13	3,131.00	1	106.00
Laguna	12	1	13	10	18	1,496.00	.....	.....
La Union	10	.....	10	14	4	3,016.00	.....	.....
Leyte	35	7	42	20	26	4,914.68	.....	.....
Mindoro	2	2	4	3	13	884.00	.....	.....
Misamis	20	1	21	13	37	3,383.00	.....	.....
Mindanao-Sulu:								
Agusan	1	.....	1	1	59	160.00	.....	.....
Bukidnon	1	.....	1	1	12	620.00	.....	.....
Cotabato	.....	.....	.....	.....	30	.....	.....	.....
Davao	2	.....	2	1	14	164.00	.....	.....
Lanao	2	.....	2	2	36	800.00	.....	.....
Sulu	.....	.....	.....	.....	27	.....	.....	.....
Zamboanga	3	1	4	2	75	327.00	1	9.00
Mountain Province:								
Amburayan	6	.....	6	5	4	1,754.00	.....	.....
Apayao	.....	4	4	1	1	606.00	.....	.....
Benguet	1	.....	1	1	13	100.00	.....	.....
Bontoc	.....	.....	.....	.....	2	.....	.....	.....
Ifugao	.....	.....	.....	.....	1	.....	.....	.....
Kalinga	.....	.....	.....	.....	1	.....	.....	.....
Lepanto	2	.....	2	1	10	1,225.00	.....	.....
Nueva Ecija	23	4	27	23	37	5,677.00	1	195.00
Nueva Vizcaya	2	3	5	4	15	664.00	.....	.....
Occidental Negros	32	.....	32	14	11	3,633.00	1	240.00
Oriental Negros	16	.....	16	13	84	1,596.00	.....	.....
Palawan	.....	.....	.....	.....	15	.....	.....	.....
Pampanga	3	.....	3	3	18	395.00	.....	.....
Pangasinan	38	4	42	28	36	11,563.48	.....	.....
Rizal	6	.....	6	4	21	901.00	1	76.00
Romblon	6	.....	6	4	4	485.00	.....	.....
Samar	47	4	51	31	14	8,088.00	.....	.....
Sorsogon-Masbate	18	3	21	14	12	2,079.00	.....	.....
Surigao	13	2	15	8	6	2,384.00	.....	.....
Tarlac	10	.....	10	7	9	1,849.00	1	265.00
Tayabas	41	3	44	21	6	4,499.00	1	126.00
Marinduque	8	2	10	5	2	1,432.00	.....	.....
Zambales	15	2	17	12	1	3,227.00	.....	.....
Total	640	69	709	454	935	119,454.62	15	2,906.16

	Parcels.	Hectares.
Total number of parcels and hectares established from 1908 to 1920	709	119,454.62
Total number of parcels and hectares cancelled in various years	15	2,906.16
Balance in force	694	116,188.46

Forest Zones.—In connection with the work of examining and classifying lands that will be disposed of and alienated by the Director of Lands, forest zone lines have been located by placing corners between forest and agricultural lands. In most cases the corners do not form a close boundary and the reason for this is that the work is carried on only in those regions which the Director of Lands needs for immediate certification.

Forest zone lines have been located in the following municipalities:

Municipalities.	*Provinces.*
Labo	Camarines Norte.
Calabanga	Camarines Sur.
Tinambac	Camarines Sur.
Naga	Camarines Sur.
Bongabon	Nueva Ecija.
Calapan	Mindoro.
Bongabon	Do.
Capoocan	Leyte.
Irosin	Sorsogon.
Labrador	Pangasinan.
San Carlos	Negros Occidental.
Mariveles	Bataan.

MAPPING AND DRAFTING SECTION.

A map of the Visayas and Mindanao on a scale of 1:400,000 was prepared, which like a similar map for Luzon made in 1919, will include all of the latest forest and other data of value. A large amount of additional data has been added to the progress maps, which are drawn to a scale of 1:100,000 and 1:20,000.

Topographical and forest data taken in connection with the work of classifying agricultural and forest lands have been compiled to accompany the reports of the forest officers who were in charge of the work and also to accompany the certification of the Director of Forestry to the Director of Lands of the portion which may be disposed of and alienated by the latter. Also, the data taken in connection with the forest reconnaissances in the northern end and southern end of Palawan have been compiled to accompany the report of said reconnaissances. In addition, tracings were made from different plans for communal forests, maps of private lands for registration, models and various other drafting work. Four thousand and seventy-three (4,073) copies of blue prints were prepared for the public in general and for official uses.

Topographical and forest notes taken during 1920.

District No.	Received.	Pending.	Total.	Forest valuation.
	Kilometers.	*Kilometers.*	*Kilometers.*	*Hectares.*
District No. 1	335.49	421.38	756.87	20.50
District No. 2	52.13	197.03	249.16	4.70
District No. 3	6.01	24.46	30.47	2.34
District No. 4	519.90	229.76	749.66	52.85
District No. 5	352.72	343.32	696.04	54.00
District No. 6	722.49	375.20	1,097.69	201.63
District No. 7	273.02	671.37	944.39	105.50
District No. 8	261.18	117.22	378.40	40.02
District No. 9	458.19	200.58	658.77	295.10
District No. 10	306.85	608.96	915.81	126.27
District No. 11	256.96	114.27	370.23	216.16
District No. 12	455.50	108.46	563.96	49.45
District No. 13	467.91	149.60	617.51	11.00
Total	4,467.35	3,561.61	8,028.96	1,179.52

SECTION OF FOREST RECONNAISSANCE.

Palawan.—In order to secure information regarding merchantable forests and to investigate the possibilities for a more intensive untilization of the northern end and the southern end of Palawan Island, a forest reconnaissance party composed of one forest supervisor and three rangers was sent out.

Northern end of Palawan.—The region covered by the party has an area of about 44,562 hectares. It extends from the coast of Malampaya sound about one kilometer to five kilometers to the interior. The country in general is rough. The hills rise abruptly from the coast and form several broken chains ranging from 200 to 500 meters in height. The rivers that drain the area are short and small, but some are navigable by bancas for a few kilometers toward the interior.

The soil cover is divided as follows:

	Hectares.
Commercial forest	23,240
Non-commercial forest and brush	17,185
Cultivated land	819
Grass and open land	313
Mangrove swamps	3,005
Total	44,562

For the purpose of administration, the whole area is divided into ten compartments and the detailed report of each compartment is filed in the records of the Division of Forest Lands and Maps. The average stand of the forest of each compartment varies from 42 cubic meters to 175 cubic meters per hectare. The principal merchantable species, are: Apitong (*Dipterocarpus* spp.), ipil (*Intsia bijuga*), amugis (*Koordersiodendron pinnatum*), akle (*Albizzia acle*), bitanhol (*Calophylum* spp.), makaasim (*Eugenia* spp.) *malugai* (*Pometia pinnata*), banaba

(*Lagerstroemia speciosa*), nato (*Palaquium* spp.), malasantol (*Sandoricum vidalii*), and sakat (*Terminalis nitens*).

The most suitable areas for sawmill sites are at Banbanan and Baluran Bays and each has enough timber in the vicinity to supply a mill having a daily capacity of 10,000 board feet. But due to the mountainous character of the country, the logging units will be small and in some cases portable mills might be used to advantage. Whenever the land is level and therefore suited for agriculture, clear cutting would be required and elsewhere a certain proportion of the trees should be left to restock the forest. In addition to the area which should be opened for agricultural purposes after the timber has been utilized, about 4,500 hectares, located mostly along the rivers, can be classified as agricultural lands. The mangrove swamps are not suited for exploitation on a large scale and should be kept for local use.

Southern end of Palawan (including adjacent islands).—The region covered by the party has an area of about 49,396 hectares divided as follows:

	Hectares.
Commercial forest	29,778.30
Non-commercial forest	12,189.90
Temporary clearings (kaingins)	1,251.20
Open or grass land	1,656.00
Mangrove swamps	4,415.00
Total	49,396.60

The area is further divided into five compartments. The first compartment comprises the southern end of Palawan and the other four compartments comprise the adjacent islands. The average stand of the forest of each compartment varies from 40 to 100 cubic meters per hectare and the important commercial species found are amugis (*Koordersiodendron pinnatum*), malugai (*Pometia pinnata*), ipil (*Intsia bijuga*), bogo (*Garuga littoralis*), maranggo (*Azadirachta integrifoliola*), nato (*Palaquium* spp.), sakat (*Terminalia nitens*), akle (*albizzia acle*), kalantas (*Toona calantos*), and makaasim (*Eugenia* spp.).

No suitable sawmill sites were found because of a number of conditions. The sites near the forest either had no harbors or else had no fresh water, and protected anchorages were either far from a forest or else were on private land. Some of these difficulties could be easily overcome, but owing to the broken nature of the country only a small mill could be operated in in this region. In all probability this country will be logged by small licensees who will take advantage of favorable weather

to raft their logs to sheltered anchorages and then sell them to mills in Manila or Iloilo.

Under the direction of several members of the faculty of the Forest School at Los Baños, the graduating class of 1921 carried on two forest reconnaissances which, while they were made for educational purposes, also resulted in the acquisition of valuable information for better forest management.

These consist of the forest reconnaissance of the Mount Lobo region in the Province of Batangas, and the mangrove swamp territory in the southern and southwestern part of Tayabas, in the municipalities of Pagbilao, Laguimanoc, Unisan, Pitogo, and Macalelon.

Mount Lobo Region, Batangas.—From Batangas Bay to Locoloco Point there are two mountains separated by a wide valley at the town of Lobo.

The first mountain on the shores of Batangas Bay was not examined because from all sides it was seen to be covered with grass, with only a few wooded gullies. The hills near Lobo were covered with brush, but this area was occupied by settlers who cleared off and abandoned successive parcels of land. Apparently by good fortune, rather than by design, these parcels came up to brush and not to grass as elsewhere on this mountain. Lone trees with long clear trunks are the sole remaining evidence that the entire mountain was once forested from top to bottom.

Conditions on Mount Lobo were different. There, the diversified geological formations have given rise it differences in topography and in vegetation. Furthermore, the remoteness of this region from all markets and centers of population has had its effect upon the occupations of the people and upon the forests.

From the Malabrigo Light House to Balibago Creek the formation is recently uplifted coral about fifteen meters above the sea. From here the ground rises gently to the higher ridges, which are of older limestone formation broken occasionally by volcanic dikes. There are precipitous crags, narrow canyons, and long cliffs in this region.

Along the coast, the land has been cleared and abandoned. The last general clearing took place in 1912, after which the settlers migrated to Mindoro to escape from the exactions of persons who claimed to own the land. The abandoned land is now covered with thorny shrubs and a few saplings of molave and other trees.

On the older limestone formation, molave occurs in a greater quantity, but because of the cliffs and because the best trees have been removed, not enough remain to warrant logging operations. In the dry season, this forest as well as that on the lower slopes is characterized by its leafless condition and the general drought resistant character of the vegetation. This is in striking contrast to the forest upon the dikes of igneous rock, which are evergreen, and contain many species of commercial importance. However, these dikes are narrow and far apart and the forest therefore is more interesting than valuable. Balibago Creek marks the dividing line between the limestone and igneous formations. From this creek to Locoloco Point the spurs from the main ridge come to the beach. The lower slopes are covered with brush and small trees, many being of commercial species. The thorny shrubs are not so abundant as on the limestone and there is a greater number of species. Clearings on steep slopes have destroyed the last of the timber that might have been logged.

Commercial forests are restricted to steep, inaccessible slopes and they are too small in area and too difficult to reach to warrant any lumbering operations.

The chief occupation of the people is raising cattle, which pick up a living in the brush lands. Feed is scarce in the dry season and while the stock is not starving yet the cattle eagerly browse on aroma (*Acacia farnesiana*), eating the tips of twigs down to the first hard thorns.

Far back, in the secluded spots, old clearings were discovered which, from the absence of bamboo and fruit trees, were evidently not made by farmers. Upon inquiry, it developed that armed parties used to take refuge in Mount Lobo after every insurrection. The oldest kaiñgins were being occupied by dipterocarps, whereas in the more recent clearings the brush land species predominated and only an occasional forest tree was found and then only at the base of the slopes which were forested.

To the north of Mount Lobo is a rolling country which is suited for stock raising. The number of stock could be greatly increased if the bits of agricultural land along streams were planted to alfalfa. However, to do this requires irrigation and irrigation is dependent upon the character of the forest cover. Nearly all the creeks are dry at their mouths and often for a kilometer or two inland. Even the largest creek, the Agas, threatens to dry up. The settlers on these streams assert that

twenty or thirty years ago water was abundant, but when the forests were destroyed by kaiñgin makers, the springs and streams dried up. It is interesting to note that the people recognize the cause of the present lack of water. Fortunately, the absence of kogon in most of the Lobo range makes the reforestation of the region easy. It is doubtful whether the present forest cover will be worth anything, as but few trees of duñgon and molave are left to produce seed. However, when the time comes to plant valuable trees, the present species will shelter the newly planted trees.

The bare mountain near Batangas is a more difficult problem, because before anything can be done, it is necessary to prevent or control grass fires, and then plant suitable forest trees. That this can be done has been demonstrated at Talisay, Cebu.

The main feature of this reconnaissance was the compilation of a topographic map showing all trails and vegetation.

About 22 hectares of valuation survey were taken, showing an average stand of 110 cubic meters per hectare in the commercial forest. The principal species found in their order of abundance are bagtikan (*Parashorea malaanonan*), makaasim (*Eugenia* spp.), molave (*Vitex parviflora*), duñgon (*Tarrieta sylvatica*), oak (*Quercus* spp.), taluto (*Pterocymbium tinctorium*) dungau (*Astronia* spp.) katmon (*Dillenia* spp.), nato (*Palaquium* spp.), and white lauan (*Pentacme contorta*).

Forest protection is an essential in order to conserve the water supply of the farming region north of Mount Lobo. This protection should include the prevention of kaiñgins and the establishment of a forest reserve to prevent encroachment upon the remaining timber supply.

MANGROVE SWAMP TERRITORY, TAYABAS.

Object.—The object of this reconnaisance work in the swamps of the southwestern coast of Tayabas Province was to study its potentialities in forest resources, so that a convenient system of forest management can be applied in the exploitation of the mangrove swamps of this region with the end in view of conserving said forests for the continuous source of supply of forest products, and at the same time allowing substantial profit both to the investor and to the public.

Ownership.—With the exception of some swamps that are legally possessed by private owners in the locality, practically all the mangles in this region are public swamps. In spite of the strong opposition of the Bureau, with its convincing evidences that said mangroves are of public domain, for one reason or other, certain tracts passed into the hands of land grabbers.

There are still swamps which are claimed by various persons who have no evidences of ownership other than three or four trunks of naturally growing nipas in places adjoining their cultivated lands.

However, roughly estimating, the whole area of swamps that may be claimed, including those that were not specifically noted during the trip, would not come to over 260 hectares or 7 per cent of the total area of the mangles reconnoitered. In order that it may be determined how much of this estimated area can be considered legally possessed by private individuals and remain their recognized property, and show how much of it will go back to the direct control of the Bureau for the better management and conservation of its forest resources, all claimants were advised to have the titles of their lands registered in the Bureau of Forestry in accordance with Section 1829 of the Administrative Code.

It is evident that unless the Bureau adopts definite measures to prevent land grabbers from planting cocos or nipas in the public swamps, and from including portions of same in the survey of their cultivated lands with a view of registering their titles of their lands, the greater part of the valuable public swamps which need to be supervised by the Government for the prepetuation of the firewood crops growing thereon and for other forestry purposes, will pass into private hands.

Surrounding People and their Industries.—The municipalities of Pagbilao, Laguimanoc, Unisan, Pitogo, and Macalelon, Province of Tayabas, under whose jurisdictions the mangroves dealt with in this report come, are located along the coast. The inhabitants are Tagalogs. Some strangers from the neighboring provinces and Chinese who are engaged in commerce are also found.

The chief industry of the people is lumbering and the cultivation of coconuts from which copra is obtained. The first consists of extracting posts, square logs, sawn boards, and railroad ties. Some are engaged in boat building, in collecting firewood and tanbark, and in making charcoal. The last is at present in the hands of some Japanese at Laguimanoc and it is becoming an important industry in this region.

In charcoal-making, the kiln method is used by Japanese, which is simple in operation and produces excellent charcoal.

The Construction and Use of the Kiln.—A pear-shaped hole of 3.80 meters in length and 3.20 meters in width toward the rear part and about 80 centimeters at the front, is excavated

in a well drained hillside to a depth of 80 centimeters. Having finished the hole, a mixture of either one-half burnt clay and one-half fresh soil or two-thirds clay and one-third ashes dampened with sea-water, forming a thick clay, is plastered along the side of the hole, making a wall about 20 centimeters thick, leaving the front face open. A chimney about 15 centimeters in diameter is dug at the back, having its lower opening at the level of the floor of the kiln and its outlet 30 centimeters distant from the rear wall. See figures 1 and 2.

The next step is to fill the space of the unfinished kiln with compact billets. Two layers of wood 1 meter in length are piled on end. The first stratum, serving as the base, needs be larger than the second over it. The remaining space is filled with short billets and twigs till an oblong dome-shape is attained, dry grass being used as a coating to smooth out all depressions. The pile of wood has a height toward the rear of 2 meters and in front of 1.40 meters. The mixture of clay is then moulded over this mound to a depth of 20 centimeters and is well beaten to make it compact. Three small holes, each about 7 centimeters in diameter, are made at the base of the dome about 20 centimeters above the ground surface, forming a symmetrical triangle. One hole is at the rear and the others are $1\frac{1}{2}$ meters distant from it. See figure 3.

The structure is protected by a roof and is left to dry for two or three days when cracks begin to appear all over the surface. These cracks must be carefully patched with the mixture of clay. Then a smudge or low fire is built at the door, the billets therein having been temporally removed, to aid the discovery of crevices and to season the oven. The smoke penetrates thru all the spaces of the tiers and through the cracks if there are any. The smudge is kept burning for about 8 days by which time no more cracks appear and the kiln is dry.

The low fire at the entrance of the kiln is then removed, and the billets are returned to complete the tiers inside and in addition thereto kindling is added. The lower half of the door is closed with the same material as the kiln, mixed with stones to make it firmer and stronger, leaving a small aperture of 6 by 12 centimeters at the bottom of the door for the admittance of a little air during the burning of the wood. See figure 4.

With all drafts open, the fire is started at the upper half of the door. The fire works its way inward and downward over the top of the wood within. As soon as the fire reaches the rear

part of the pile, which can easily be noticed through the holes, the door is walled up with the exception of the small hole below, and also either hole on the side of the kiln is entirely closed. One hour after, the vent on the opposite side is closed and 3 hours later the rear hole follows, leaving open only the small vent at the bottom of the door and the chimney, by which further burning is regulated. The kiln requires frequent attention. The boss or his assistant must observe closely that the fire within is not put out or the charcoal is not over burned. An amateur charcoal maker needs but a little practice and close observation at the beginning in order that he can make as good charcoal as an expert. See figures 5 and 6.

Firewood inside will continue to burn for about four days. During this time the smoke escaping at the chimney is dark in color. When the process of combustion inside the kiln is completed, the smoke rising from the chimney begins to be lighter in color and transparent, and can only be noticed as a whitish vapor when about one meter above the hole, thus indicating that all the wood inside has turned to glowing embers. This is the sign that all holes must be closed to entirely exclude the air and to put out the embers. It takes about three days for the embers to cool. The sign that there is no more fire inside the kiln is the cessation of the wave-like refraction of the heated air about the surface of the kiln. When no more heat waves are seen the door is opened for further cooling of the charcoal inside the kiln, which may require two or three hours, depending upon the temperature of the day. The charcoal is then taken out and the oven is filled with new billets as already described.

The kiln will remain in use for several years, if the clay is properly prepared and applied.

Three cords of firewood is the regular capacity of the kiln above described and 28 to 30 big sacks or about 5 cubic meters of charcoal can be obtained. This slight variation of the amount of charcoal obtained depends on the loose or close piling of the billets and upon under or over burning of the charcoal.

Ten and eighty-three hundredths cubic meters or 3 cords of loosely piled wood contain seven and six tenths cubic meters of solid wood and yield 5 cubic meters of charcoal, the approximate loss being 1.5 cubic meters. For further information in this connection see labor.

Fishing must not be overlooked as it is one of the important industries in the region, especially in Pagbilao and Laguimanoc.

The people engaged in this business are mostly from Cavite Province. Fish-corals are generally used in trapping fish in Tayabas Bay. A big quantity of fish is caught and exported every day and people who are engaged in this enterprise are making good money. Some people who see the great importance of this industry are establishing fishponds in the swamps wherein to rear the fry of a certain species, which they know will, upon arrival at a certain age, give them a tenfold profit when sold in the market.

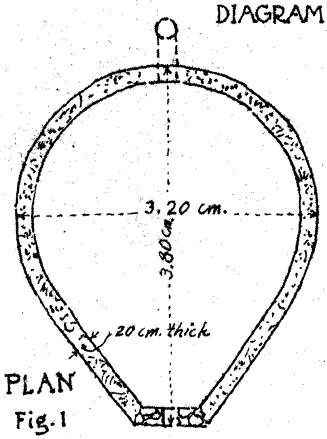
Fishing in the Swamps.—Some of the poor, especially those who live in the neighborhood of the mangroves, close the mouths of the creeks and rivers with a bamboo screen during high tide in order to entrap the fish at low tide, while some who do not have a screen just wander through the swamps and pick up such clams, teredoes, barnacles, and crabs as they may find. The fish that are abundant in the swamps are white perch, mullet, gobies, anchovies, shirmps, slip mouths, basking shad, and many others.

Among other profitable uses of the swamps not developed in this region are salt-making, extraction of tuba from nipa for vinegar or wine, making of shingles from nipa leaves, and extraction of corkwood (daluru).

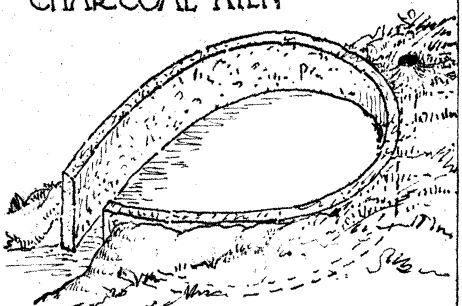
Locations and Area Covered.—These swamps are located along the southern and southwestern coast of Tayabas Province, from Verde Point 2.7 kilometers, south of Pagbilao to Osly River, including the swamps in Pulo Grande Island under the jurisdiction of the municipality of Pagbilao; thence from Osly to Kinagonan River, under the jurisdiction of the municipality of Laguimanoc; thence from Kinagonan to Cabulihan River, under the jurisdiction of the municipality of Unisan; thence from Cabulihan to Suliao River, under the jurisdiction of the municipality of Pitogo; and thence from Suliao to Cabuluan River, under the jurisdiction of the municipality of Macalelon. The areas in the different municipalities are approximately as follows:

	Hectares.
Area of swamps in Pagbilao, including Pulo Grande Island	1,100
Area of swamps in Laguimanoc	769
Area of swamps in Unisan	454
Area of swamps in Pitogo	644
Area of swamps in Macalelon	662
Approximate grand total	3,629

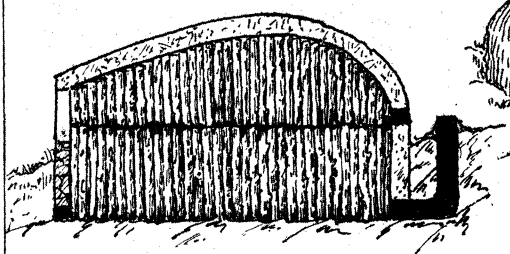
DIAGRAM SHOWING THE CONSTRUCTION OF CHAR-COAL-KILN



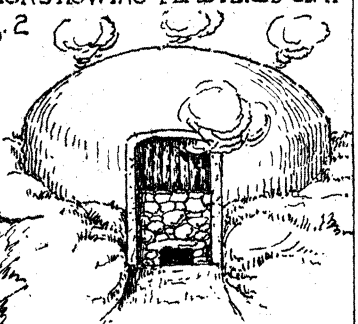
PLAN
Fig. 1



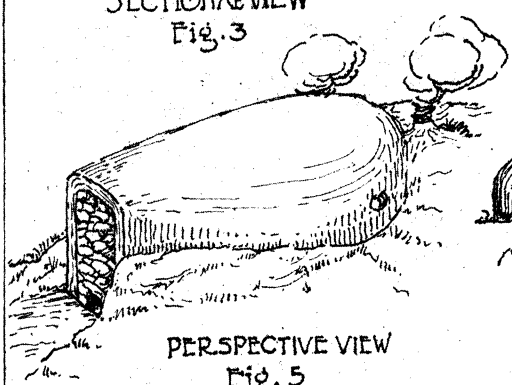
EXCAVATION SHOWING PLASTERED CLAY
Fig. 2



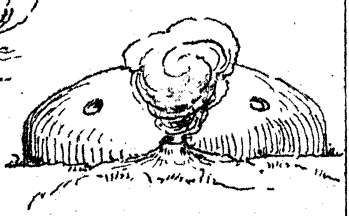
SECTIONAL VIEW
Fig. 3



FRONT VIEW
Fig. 4



PERSPECTIVE VIEW
Fig. 5



BACK-VIEW
Fig. 6

These mangrove swamps do not form a continuous strip along the seacoast, but are interrupted by elevated lands which are either covered with kogon or are planted with cocos. However, extensive swamps of about 1,000 hectares are found between Maruhi and Hinguiuin Rivers, in the jurisdiction of the municipalities of Pagbilao and Laguimanoc; the swamps toward the east and southeast of this vary in area from 10 to 300 hectares, situated mostly along the basins of the rivers draining the region.

Degree of Exploitation.—Prior to the year 1916, there was but little firewood business on the southwestern coast of Tayabas, due perhaps to the scarcity of coastwise transportation. But just as soon as the railroad line extended thru this region, giving a means of daily transportation between Manila and Hondagua, speculators from the neighboring provinces and from Manila commenced to compete with old licensees by applying for unoccupied cutting areas. Later on a strong rivalry between them was aroused. Each one was trying to watch the irregularities committed by other and when enough data was collected, the interested party would either take up the matter direct with the officer in charge or forward the case to the Bureau asking for an immediate investigation and transfer to himself of the area occupied by his victim. If it so happened that the report made by the forest officer was contrary to the desires of the interested party, or he thought that he had a very strong rival for some area, he would rush to some one with a "pull" who he thought would back him up. Because of this, forest officers are having a hard time in carrying on their work successfully. Some of the licensees who started with their own capital made the best utilization of the forest, and naturally gained much money in the business, while others who started with very little capital or with borrowed capital became very poor and even lost their cutting areas.

After the opening of the daily transportation facilities in this region, continuous shipment of large quantities of firewood from Tayabas have been made and are still going on. The municipalities favored by this are Pagbilao, Laguimanoc, and Unisan. Pitogo and Macalelon are still shipping their firewood to Manila and other markets by sea.

The following table shows the number of licensees and the amount and kind of forest products exported by them from each municipality from January to November, 1920:

Name of municipalities.	Kind of forest products.						
	Number of active licensees.	Tanbark. Tangal in kilos.	Firewood. Langarai in cubic meters.	Firewood. Tangal and bakauan in cubic meters.	Charcoal. Tangal and bakauan in cubic meters.	Total cubic meters.	Per cent of firewood.
Pagbilao	13	.....	4,204	5,636	.....	9,840	49
Laguimanoc	8	.....	3,887	877	290	5,054	25
Unisan	4	.....	1,048	429	.....	1,477	7
Pitogo	2	.....	17	.....	.....	17	1
Macalelon	4	2,511	.....	3,612	.....	3,612	18
Total	31	2,511	9,156	10,554	290	20,000	100

Some of the poor people are gathering firewood in insignificant amounts, say from 4 to 8 bundles each, from these swamps and they dispose of it for local consumption. This firewood is not listed in the records of the municipal treasurer, as no forest charges are paid on the same. Licensees are also selling firewood to the local bakeries and restaurants, but to a very limited extent, which will not come to 2 per cent of the total amount exported.

Uses of the Different Species.—The species cut extensively for firewood are bakauan (*Rhizophora* spp.), tangal (*Ceriops tagal*), langarai (*Bruguiera* spp.) and small quantities of other species. The first two species are also cut for charcoal. Tangal and bakauan are the two species preferred by the licensees because of the high quality of firewood and charcoal secured from them and because of the better prices which are realized from them. The bark of tangal, and rarely bakauan and pototan, is collected for tanbark. The bark of tangal is used locally for coloring tuba and for dying fish nets. The following list shows the various uses in this region of the different species found within the limit of these swamps, especially in regions where the high land forest is from 5 to 10 kilometers distant from the town.

Posts, tools handles; and railroad ties.—Tabau (*Lumnitzera littorea*), Dungon-late (*Heritiera littoralis*), and tabiging-itim.

Boards.—Pagatpat (*Sonmeratia caseolaris*) and rarely Pototan.

House frame work.—Pototan, tangal, bakauan, langarai, tabau, and pagatpat.

Piling.—Dungon-late, tawalis (*Osbornia octodonta*), and pagatpat.

Over-cut areas.—As a result of the studies made it is estimated that almost 46 per cent of the total area of the swamps, or 1,692 hectares, are heavily over-cut for firewood, thus de-

priving these areas of their merchantable species. This over-cutting is distributed under each municipality as follows:

Names of municipalities.	Over-cut area in hectares.	Per cent of total over-cut by municipality.
		Per cent.
Pagbilao	732	41
Laguimanoc	384	23
Unisan	194	10
Pitogo	161	13
Macalelon	221	13
Total over-cut areas	1,692	100

From the above-table it can be seen that Pagbilao represents the biggest percentage of heavily over-cut areas, and some of them, especially those that are located south and east of the town and south of barrio Malicboy, have very few desirable species left and need a rest. Laguimanoc ranks next in its over-cut areas and will soon reach the same condition as Pagbilao. Unisan, like the preceding towns, does not think of the perpetuation of its forest resources altho its over-cut area is almost ½ of its total area of swamps. It will soon feel the shortage of firewood. Pitogo and Macalelon have a smaller percentage of over-cut areas at present, but they are very likely to follow the examples of their neighbors.

The above-mentioned over-cut areas are conspicuous on all the banks of the streams and in the case of the swamps of Pagbilao extend even over the entire swamp. One can easily see them from the railroad.

Labor.—There is a great scarcity of labor in this region and one can hardly hire a laborer for less than ₱1.50 a day. The great majority of the laborers engaged in the extraction of firewood and tanbark are imported from the Island of Marinduque and few, if any, are brought from other provinces. Some Japanese workers are also found, but they are mostly employed in charcoal-making and in lumbering.

Split firewood in this region is classified into three grades. The first grade is about 64 centimeters in length and 3 to 4 centimeters in thickness. It is split from the larger pieces. The second grade is about 62 centimeters in length and 2 to 3 centimeters in thickness. It is split from pieces of smaller diameter. The third grade is about 60 centimeters in length and 1 to 2 centimeters in thickness. It is split from the smallest diameter. Rajas are about one meter in length and from 5 to 6 centimeters in thickness and are split from trees of 10 to 20

centimeters in diameter. The cutting of the poles into lengths is done with hand saws and the splitting is done with short bladed, narrow axes, commonly known as belt axes.

The licensees carry on their operations in their cutting areas by means of contracts. In many cases, the laborers secure money in advance from the licensees. They are paid on the basis of the number of bundles of all grades of rajitas of 50 pieces a bundle, and by the number of pieces of rajas that they can deliver at any landing within the cutting area which is accessible to light bancas. The licensees pay all additional expenses in getting the firewood to market, including transportation from place of piling to either the railroad station or the anchorage of the freight boats, and also the cost of loading. The bancas used are furnished by the licensees.

In different municipalities and in swamps distant from the railroad stations, or the landing of the boats, the cost of cutting and transportation varies thus: operations near the railroad stations are from ₱3 to ₱5 more than those cutting and splitting in the distant swamps, but the cost of transportation of the firewood from place of piling in the cutting areas to the railroad stations is just the reverse. The licensees even offer to the same transporters a higher rate of pay in loading the railroad car.

The laborers employed in the operations in swamps near the railroad stations are those who have, if any, but very small amount of debts to the licensees; while the laborers employed in the work in the distant swamps are those who have taken big amounts of advance payment. Here lies the reason why the laborers cannot ask for a higher rate of pay or break loose from the licensees and find a job with better pay. This is also the reason why the licensees can do just what they please with the poor and ignorant laborers.

The following tables show the different costs of operations in the different municipalities based on 100 bundles of rajitas or 1,000 pieces of rajas, although the licensees generally sell their firewood to the purchasers by the carload, the price depending upon the number of bundles of firewood or rajas that the car may contain.

Cost of operations of making firewood (rajitas) for all species and grades in the swamps near the railroad stations of Pagbilao and Laguimanoc.

Cutting, splitting, and tying 100 bundles	₱11.00
Transportation to the railroad station	3.00
Loading into the railroad car	1.00
Forest charges (bakauan and tangal, 3.56 cu. m.)	.71
Total cost of operation	15.81

Cost of operations in places distant from railroad stations, Pagbilao and Laguimanoc.

Cutting, splitting, and tying 100 bundles	₱8.00
Transportation to the railroad station, 100 bundles	6.00
Loading into the railroad car, 100 bundles	1.50
Forest charges (bakauan and tangal of 3.56 cu. m.)	.71
Total cost of operation	16.21
Average total cost of operation	15.96

Selling price in the locality delivered on railroad cars.

100 bundles first grade rajitas	₱29.00
100 bundles second grade rajitas	24.00
100 bundles third grade rajitas	20.00

From the above table it can be seen that the extraction of rajitas in these two municipalities is the same for all grades of all species, but the local selling price for the three grades varies. The average cost of operations to the licensees per 100 bundles of firewood delivered at the railroad cars is ₱15.96 The licensees do not consider other expenses such as supervision of the work in the swamps, and the conducting of the business, and the depreciation of bancas. The licensees, therefore, make a net gain on first grade rajitas of ₱13.04, on the second grade of ₱8.04, and on the third grade of ₱4.04 per 100 bundles.

Cost of making rajas out of tangal and rarely langarai, in the swamps of Laguimanoc and Pagbilao near the railroad stations.

Cutting and splitting 1,000 pieces or rajas	₱15.00
Transportation to the railroad station, 1,000 pieces	9.00
Loading on railroad car, 1,000 pieces	1.20
Forest chrages on 1,000 pieces or (5.73 cu. m.) tangal and bakauan	1.15
Total cost of operations	26.35

Cost of operations distant from railroad stations, Pagbilao and Laguimanoc.

Cutting and splitting 1,000 pieces of rajas	₱10.00
Transportation to railroad station, 1,000 pieces of rajas	12.00
Loading on railroad car, 1,000 pieces of rajas	2.00
Forest charges on 1,000 pieces or (5.73 cu. m.)	1.15
The selling price in the locality of 1,000 pieces of rajas (tangal and bakauan) delivered on railroad car is	40.00
Average total cost of operations, 1,000 pieces	25.75
Profit per 1,000 pieces of rajas	14.25

If the stuff is mostly langarai, deduct ₱5 from the local selling price.

The licensees realize a larger profit on their business when they ship their firewood directly to Manila and sell it there than if they sell it to local dealers. But many of the licensees who have a meager capital, if they have any, could not do this because they always need ready cash to run the business and can not afford to wait for uncertain times of payment by their customers.

The following table will give one a fair idea of the additional gain when the firewood is sold at the Manila market, based on 100 bundles of rajitas or 1,000 pieces of rajas:

Average cost of operations of rajitas and their transportation from Pagbilao and Laguimanoc to Manila.

Cutting, splitting, and bundling 100 bundles	₱9.50
Transportation to the railroad station, 100 bundles	4.75
Loading into railroad cars, 100 bundles	1.25
Forest charges (bakauan or tangal, 3.56 cu. m.)	.71
Freight charge to Manila on railroad car	7.72
Total cost to the licensees	23.93

Selling price in Manila delivered at the railroad station.

100 bundles first grade rajitas	₱40.00
100 bundles second grade rajitas	36.00
100 bundles third grade rajitas	32.00

If a lot is all langarai, deduct ₱2 from each of the above selling prices.

From the above figures, it can be seen that the licensees make a gain of ₱16.07 per 100 bundles on first grade rajitas, ₱12.07 per 100 bundles on second grade and ₱8.07 per 100 bundles on third grade, when their firewood is sold in the Manila market, delivered at the railroad station at Paco or Tutuban. The total cost of operation and transportation to Manila is ₱23.93 per 100 bundles. The additional gains of the licensees when their firewood is sold in Manila are as follows:

Manila selling price per 100 bundles.		Local selling price per 100 bundles.	Additional.
On first grade rajitas	₱16.07	₱13.04	₱3.03
On second grade rajitas	12.07	8.04	4.03
On third grade rajitas	8.07	4.04	4.03
Total gain on 300 bundles on 3 different grades			11.09

Average total cost of operations in Laguimanoc, 1,000 pieces	₱25.75
Transportation to Manila based on 5.73 cubic meters	12.89
Total cost of operation and transportation	38.64
Selling price in Manila	60.00
Total cost of operation and transportation	38.64
Net gain in Manila	21.36
Net gain in locality	14.25
Additional gain when sold in Manila	7.11

If the stuff is mostly langarai, the selling price will be ₱50. Licensees in this locality do not deal much in rajas, as they said they could get more money from rajitas inasmuch as the latter are easier to handle than the former.

The following information as given by the licensees will enable one to find out how much gain a licensee can make for every carload of firewood of different grades:

One N. B. B. Car loads 1,000 bundles of first grade rajitas.
One N. B. B. Car loads 1,000 bundles of second grade rajitas.
One N. B. B. Car loads 1,300 bundles of third grade rajitas.
Freight charge from Laguimanoc to Manila, ₱80 to ₱90.
Approximate contents of one carload, 40 cubic meters.
One car of N. B. B. size will contain 7,000 pieces of rajas.

The cost of operations of firewood in the southwestern coast, including Unisan, Pitogo, and Macalelon is cheaper than that in the southern coast of Tayabas. Laborers are paid ₱6 per 100 bundles of rajitas and ₱10 per 1,000 pieces of rajas delivered at any designated landings by licensees. Unisan sends its firewood either to Panahon or directly to Manila; or else the firewood is sold at the landings to any boat calling at the place for ₱10 per 100 bundles on rajitas and ₱17.50 per 1,000 pieces of rajas. If their firewood is ever sold in Manila it is shipped under contract, that is, one-half of the firewood loaded on board is given to the owner of the boat as freight charges. In the latter case the licensees incur additional ₱2 expense for the transportation and loading on board for every 100 bundles of rajitas or 1,000 pieces of rajas. For the selling price in Manila, see preceding tables. The above information refers only to bakauan and tangal.

The firewood cut in these three towns is generally second grade rajitas, so that no different costs of operations on the other grades have been discussed under this paragraph.

Tanbarks.—The collection of tanbark in these swamps is very limited and only one licensee in Macalelon has been found extracting a little of this forest product. The following information may not be very reliable, as this was taken from one licensee only and from his first trial shipment of the bark; it is here given simply to convey an idea how the transaction of the business is done in this locality, based on one shipment of tanbark. The laborers are paid 20 centavos per bundle of tanbark one meter in length and 65 centimeters in diameter, weighing nine kilos if dry. An additional expense of 2 centavos is incurred in the transportation of every bundle from the landing to the boat. The freight charge is one-half of the quantity of the product loaded. The selling price in Manila is from 40 to 50 centavos per bundle minus the corresponding forest charges, which is 10% of the selling price, or 4 to 5 centavos, leaving to the licensee the amount of 35 to 45 centavos or an average of 40 centavos. From this it can be seen that if the product is sold at 40 centavos per bundle, the licensee will lose 8 centavos and, if sold at ₱0.50 he will gain only one centavo per bundle, which is a very poor business.

Charcoal-making.—Like the operations of the other forest products in the swamps, charcoal making is also carried on by contract. The boss who is adept in charcoal-making usually sells his product at an average rate of ₱1.40 per sack at the point of production, ₱2 if he delivers it at the railroad station of Laguimanoc, or ₱2.25 at Tutuban, Manila.

In the preparation of the charcoal, the boss spends for labor ₱4.50 per cord of wood, which is equivalent to 10 sacks in charcoal or an average expense of ₱0.45 per sack. Adding to this the cost of packing, which is usually 2 centavos per sack, the total cost of preparation is 47 centavos a sack.

From point of production to Laguimanoc Railroad Station, the transportation expense incurred by the boss is 20 centavos per sack, and if sent to Tutuban, Manila, the expense incident is 20 centavos per sack.

Taking all these different factors into consideration, the net earnings of the boss per sack runs thus: ₱0.93 at place of production, ₱1.33 at Laguimanoc, and ₱1.38 at Tutuban.

One kiln holds 3 cords of firewood which, when turned to charcoal, will average 30 sacks of good charcoal. It takes about 10 days to make a batch of charcoal or an average of 3 kilns per month. The boss's monthly earnings then will

be his share of the 90 sacks of charcoal turned out of every kiln. This is further illustrated in the following table:

Net earning per sack in different places of delivery.	Net earning per month for 90 sacks.
₱0.93 in point of production	₱83.70
₱1.33 delivered at Laguimanoc Railroad Station	119.70
₱1.38 delivered at Tutuban	124.20

From the above, it can be seen that the farther the distance the charcoal is delivered to the licensee the more money the boss can earn. But this is not all, one boss with the assistance of 4 laborers who are paid ₱2 each per day, can keep five ovens burning constantly.

The following statements show the possible monthly earnings of an expert boss managing five kilns at a time with the assistance of a crew of 4 men.

In the place of production:

5 kilns with an average of 450 sacks of charcoal, at ₱0.93	₱418.50
4 laborers, at ₱2 per day	240.00
Monthly earning	178.50

At the railroad station, Laguimanoc:

5 kilns with an average of 450 sacks of charcoal, at ₱0.93	₱418.50
4 laborers, at ₱2 per day	240.00
Monthly earning	358.50

At the railroad station at Tutuban, Manila:

5 kilns with an average of 450 sacks of charcoal, at ₱1.38	₱621.00
4 laborers, at ₱2 per day	240.00
Monthly earning	381.00

In the foregoing earnings of the boss, occasional and personal expenses of his own or his agent administering the conduction of the charcoal to the points of destinations have not been included, due to lack of information regarding same. However, if there is such an agent, it is safe to state that he would not earn more than ₱60 per month, which amount should be deducted from the monthly earnings of the boss in the different places of delivery.

If the licensee himself is to transport the charcoal from the place of manufacture to Manila, he will incur the following expenses per carload of 130 sacks:

Cost of 130 sacks, at ₱1.40 from place of making	₱182.00
Transportation to railroad station, at ₱0.20 per sack	26.00

Freight charge on 130 sacks (J type car)	₱26.00
Forest charges (21 cu. m.)	8.40
Unloading and transportation on car to store of purchase	10.48
Total expenses	252.80
Wholesale price in Manila of 130 sacks, at ₱2.50	325.00
Total expenses for 130 sacks	252.80
Total gain of the licensee	72.00

If the licensee can ship to Manila the whole output of 5 kilns every month, he will then have an average of 3 cars of charcoal monthly, or a gain of ₱216.60 a month.

In Manila the charcoal is sold by retailers, at ₱0.10 per kilo. One sack contains from 30 to 37 kilos, depending upon the way the charcoal is packed in the sack and upon the species used. Thus the dealers are gaining from ₱0.50 to ₱1 per sack of charcoal sold. This information refers to the mangrove species only.

One J type freight car will hold 130 sacks of charcoal and the freight charge on same is about ₱25.

From the above, the cost of building the kilns for at least ₱100 each and the cost of bags for ₱0.20 each have not been taken into account; these are borne by the licensee.

Violations.—The cutting of small trees of bakauan, tangal, and langarai below the diameter limit is the most noticeable violation observed in practically all the swamps traversed from Pagbilao to Macalelon. Due to this is the present poor stand of the best species (bakauan and tangal especially), which have suffered much cutting in the past. It will no longer be a paying proposition for big licensees if they are required to stick to the diameter rules for the above species. In order to suit the commercial necessities of the licensees in this particular region, it is advisable to turn all ordinary licenses into license-agreements, whereby the licensees are allowed to operate under no restriction of the diameter limits, but are obliged to replant all over-cut areas with selected species that forest officers may designate, although ordinary licenses with due restrictions and close supervision are also good. In so doing, we will not only improve the stand growing in the swamps, but also prevent the licensees from exterminating the most desirable species and at the same time hinder them from disregarding the cutting rules. If these remain in force as at present the work will require stricter and closer supervision, which means much effort on the part of the Bureau of Forestry, otherwise our swamps will be depleted of desirable species.

As in the past, it is still a practice of some of the licensees to accept compensation from others for permission to gather forest products in their license areas.

Some of the licensees have procured their licenses through fraud and misleading statements.

The above violations by some of the present licensees, which are in violation of Section 4, paragraphs (*h*), (*i*); and (p. 3) of the Forest Regulations, can be attributed to the fact that some licensees have other more important business to attend to, wherefore they neglect the supervision of their cutting operations, while others merely take a license with the idea of profiting from it without investing any capital.

Some invoice timbers cut outside of their areas, especially species that do not exist in quantity in the swamps covered by their licenses, in order to avoid paying the additional forest charge of 100 per cent. Some transport their firewood from the cutting areas to Lucena and Pagbilao without first invoicing same, which is an open violation of Section 3 of the Administrative Order No. 42. This firewood sometimes is sold in Lucena for local consumption. When this is the case, the consequence is that the corresponding forest charges are not paid at all.

Vegetation.—The vegetation and condition of the swamps as observed can be divided into three classes and is distributed in the municipalities as follows:

1. Commercial forest comprises approximately 2,700 hectares or 74 per cent of the total area of the swamps. This is the forest where firewood and timber can be obtained in commercial quantity.

2. Non-commercial forest comprises approximately 907 hectares or 25 per cent of the total area of the swamps. This is the forest where firewood and timber can not be obtained in commercial quantity.

3. Nipa comprises approximately 22 hectares or 1 per cent of the total area examined.

The following table shows the approximate distribution of the mangrove swamps in the five municipalities:

Names of municipalities.	Commercial forest in hectares.	Non-commercial forest in hectares.	Nipales in hectares.
Pagbilao	823.50	275.00	1.50
Laguimanoc	576.50	192.00	0.50
Unisan	335.00	113.00	6.00
Pitogo	477.00	161.00	6.00
Macalelon	488.00	166.00	8.00
Total areas	2,700.00	907.00	22.00

Valuation surveys of 7.94 hectares were taken between creeks and rivers, in the representative stands from these areas. By representative stand is meant the stand where few or no cuttings have been made. Strip and plot methods of valuation surveys were used in determining the composition and approximate stands of the forest. The average number of trees per hectare is 1,656, with an average volume per hectare of 158.06 cubic meters, mostly of firewood with very little timber.

The stand tables which are attached to the reports of the individual compartments show that the condition of the stands per hectare of the swamps from Pagbilao to Unisan is poor and according there can be cut from 200 to 3,000 trees, or 27 to 130 cubic meters, per hectare chiefly firewood, with very little timber. This is due to the heavy cuttings of the desirable species. The condition of the swamps in Pitogo and Macalelon is still good and the stand per hectare ranges from 4,000 to 7,000 trees, or 200 to 500 cubic meters. This condition is due perhaps to the slow movement of the business in this locality, attributed to the difficulty of transportation.

Composition of the forest.—The species found in these swamps are listed below in order of their abundance:

Langarai (*Bruguiera parviflora*) is a tall, slender tree. It is found in many places in the interior of the swamps in pure stands and rarely at the bank of the rivers. It is also found mixed with api-api (*Avicennia officinalis*) and with other species of *Bruguiera*. In virgin swamps, it is represented by 451 trees, or 66 cubic meters, to the hectare. The biggest specimens are found in the swamps of Pitogo and Macalelon, reaching about 40 centimeters in diameter and over 15 meters high.

Tañgal (*Ceriops tagal*) is found in pure stands in the interior of the swamps, usually next to langarai, although it is sometimes found growing mixed with other species along the river banks. Due to the heavy cuttings made by licensees in the past, the remaining trees are almost all poles and seedlings. The biggest specimens of this species are found between Tuna and Macalelon Rivers, reaching 15 centimeters in diameter and about 5 meters in height. Only slightly cut-over areas, there were found 496 trees per hectare, with a volume of 21 cubic meters.

Bakauan (*Rhizophora candelaria* and *R. mucronata*) is found growing at the outer edge of the swamps, along the banks of the rivers and creeks and rarely on the seacoast. It is seldom found mixed with other species in the interior. The majority of the

trees noted are short boled, crooked, and branchy, due perhaps to the abundance of light they receive. Among other species found near the banks, there were found 357 trees of bakauan per hectare, with a volume of 20.91 cubic meters. The biggest specimen noted was about 35 centimeters in diameter. Bakauan is rarely cut by other licensees than the charcoal makers.

Tabigi (*Xylocarpus granatum*) abounds near the banks of the upper course of the rivers and creeks associated with other species. Piagau (*Xylocarpus moluccensis*) is also found here, being called locally tabiging-itim. The former differs from the latter in that its trunk is usually crooked and very often rotten and its bark is smooth and light-colored, while the latter has a straighter and taller bole, with dark flaky bark. In the zone where tabiging-itim is found, it reaches 40 centimeters in diameter with a height of 9 meters. Of the two species there is an average stand of 103 trees, or 13 cubic meters per hectare. Tabiging-itim is used locally for house posts. The bark of tabigi is gathered for tanning purposes.

Busain and pototan (*Bruguiera conjugata* and *B. sexangula*) are found scattered in every part of the swamps, but sometimes they appear in larger numbers with other species in the upper parts of the streams. Not much cutting has been made of these species. However, many of the trees with the bark stripped off were noted. The biggest specimens noted were 45 centimeters in diameter with a length of 15 to 20 meters. In virgin forests there is a stand of 45 trees, with a volume of 11.28 cubic meters per hectare.

Buta-buta (*Excoecaria agallocha*), locally known as lipata, is a poisonous tree commonly found at the inner edge of the swamps. It has milky sap. It is said that if a small drop of the sap get into the eye, it will cause blindness. Nothing has been learned of the use of this tree. The biggest specimen noted was 25 centimeters in diameter with a length of 10 meters. There is a stand of 61 trees, with a volume of 1.60 cubic meters per hectare.

Api-api (*Avicennia officinalis*) is found along the upper edges of the swamps. In some places it is also found along the coast. In such places it is almost in pure stands. It is also found occupying cut-over areas, if immediate natural reproduction of other species has not taken place. This species is not being cut for any use. The bole is usually short, although there is occasionally one that reaches 10 meters in height. The biggest diameter noted during the studies is 100 centimeters. The

stand, including perhaps other species of the same genus, amounts to 55 trees per hectare, with a volume of 12.14 cubic meters.

Saging-saging (*Aegiceras corniculatum*) is a small tree or shrub which is found along stream banks in the inner part of the swamps. Nothing has been heard of its use. There are about 41 trees per hectare, with a volume of 1.91 cubic meters.

Duñgon-late (*Heritiera littoralis*) grows on the inner part of the swamps. This is locally used for house posts. The largest specimen noted was 35 centimeters in diameter with a length of 8 meters. There is an average stand of 17 to the hectare, with a volume of 2.49 cubic meters.

Tabau (*Lumnitzera littorea*) is a tall tree found in very limited numbers, widely scattered along river banks in these swamps. Very few, if any, have been cut of this species either for local or commercial use. The largest specimens recorded reach 50 centimeters in diameter with a height of 10 meters. There is a stand of 17 trees, with a volume of 6.19 cubic meters per hectare.

Tawalis (*Osbornia octodenta*) grows at the outermost edge of the swamps along stream banks. It is characterized by its crooked trunk. This is cut for posts and is said to last long in the ground. The largest specimens were found in the swamps of Macalelon reaching 40 centimeters in diameter with a length of 5 meters. There are about 8 trees, with a volume of 0.94 cubic meters, per hectare.

Nilad (*Scyphiphora hydrophyllacea*), locally known as sagasa, is a shrub growing along stream banks in the swamps. It is rather scarce. No firewood is obtained from it. The biggest specimen recorded was 20 centimeters in diameter. There are about 3 trees per hectare, with a volume of .19 cubic meter.

Pagatpat (*Sonneratia caseolaris*) is seldom found in these swamps. It is practically absent in the swamps of Pitogo and Unisan and exceedingly rare in the swamps from Pagbilao to Unisan. The trees recorded are all of medium size. They amount to only 2 trees per hectare, with a volume of 0.50 cubic meter.

Nipa (*Nipa fruticans*) is a palm found growing in small numbers in narrow patches along the river banks, near and about the inner edges of the swamps. It is also often found along the outer edges of coconut groves. These nipas are practically all claimed by private individuals, but judging from the actual condition of the plants, it seems to indicate that they

grow there naturally and it was perhaps through utilization and possibly a little clearing made around them that they look somewhat improved. The actual condition of these nipas is very poor. They have been deprived of their leaves. There are but 2 or 3 leaves left on most trunks, which can hardly keep them alive. No further information has been obtained regarding nipa, inasmuch as it is only gathered by the needy persons for personal use.

Possible Annual Cut.—After considering all factors that may lead to the slow annual growth of this forest, it can be conservatively estimated that the annual increment of all species preferred for firewood will not be less than 5 per cent of their present average stand of 119.05 cubic meters, that is, 5.95 cubic meters per hectare. (The species include in this estimate are bakauan, tañgal, langarai, and pototan.) As has been stated in the preceding table, the approximate total area of commercial swamps is 2,700, therefore the approximate possible total annual increment will be 16,065 cubic meters. If the licensees occupying these swamps will only cut merchantable sized trees to this amount for firewood per annum, it is supposed that the forest will not be impaired nor depleted of the best species. On the other hand, the oppressed young trees will not only be given space, but they will receive the necessary light for faster growth.

Reproduction.—The reproduction of almost all the mangrove species in these swamps is, in general, prolific, except in newly cut-over areas and a few places which the natural dissemination of seeds has failed to reach. So far, none of the licensees have practiced any planting and all restocking of cut-over areas and open spots is left in the hands of Nature.

The season of heavy seeding of the mangrove species in this region was not observed by the party during its stay in this province. However, it is believed that it takes place during the months of April and May, although light seedings of some of the trees of various species was noted in almost all the areas throughout the year.

In places where langarai is found in almost pure stand, there were counted from 3 to 10 seedlings of langarai, with 1 or 2 seedlings of other species, per square meter, or 30,000 to 100,000 seedlings up to 3 meters in height to a hectare. This is also true of tañgal. But these are exceptional spots where the reproduction is good in a zone along the bank of the streams, but very poor in the interior of the forest. Pototan has a

poor reproduction, despite the fact that it produces plenty of healthy mature fruits. It is believed that its failure is due to the enemies of the seeds when dropped in the ground. Crabs are said to eat the seeds. Api-api has excellent reproduction in the drier places and from poor to fair when it takes the place of better species in cut-over areas. Tabigi and others species have poor reproductions in almost all the areas.

Remarks and Recommendations.—For the better management and conservation of forest resources, it is necessary that a definite plan be followed with the end in view of placing all mangles in the Philippine Islands under the absolute control of the Bureau of Forestry. Unless such a step is taken, the private claimants will remain always as a menace and a burden to the administration of public forest in the Philippines. As a first step in this direction, all mangrove areas covered in the reconnaissance should be studied with a view of declaring same as forest zones, thereby bringing the administration of said swamps more directly under a stricter supervision than they are at present. In this case, claimants will have to fight for their claims in order not to be excluded from the forest zone proposed, instead of the Bureau doing the fighting, which is in many cases difficult and costly, if not entirely a failure.

For the increasing local demands for fish, which at present can hardly be supplied by fish trapped in the fish-corrals in the sea, which deficiency can only be remedied by converting mangroves into fishponds, it is recommended that all cut-over swamps near towns and railroad stations, which, due to their nearness to the shipping points render them more desirable for fishponds, be approved for this purpose with the usual restrictions contained in the fishpond agreements.

All comparatively dry swamps adjoining cultivated lands, which are mostly occupied by api-api and other undesirable species and which are less affected by the tide, are recommended for nipa plantations and salt-works.

ADMINISTRATIVE DIVISION.

GENERAL STATEMENT.

The work of this division involves the general supervision of all the clerical work of the Bureau, the keeping of efficiency and civil service records of the employees the direct control of the records of the Bureau, the preparation of estimates for the annual appropriation and supervision over its distribution, the care of the property, the control of the clerks in the provinces, the upkeep and maintenance of the office building, the super-

vision of the general section and the general administration of the office, including the preparation of such letters appertaining to other divisions as well as to its own.

The correspondence received in this office during the year has increased enormously due to the increase in personnel and in the increase of activities in the lumber industry; but on the other hand, clerical personnel has not increased at the same rate thus overworking the scanty clerical personnel in this Bureau. Attempts have been made to remedy this situation but unfortunately, due to the scarcity of funds, it has not been possible to secure the desired number of additional clerks or to promote those that were competent and deserving of higher pay.

In June of this year, at the suggestion of the Insular Auditor, the Cashier and Disbursing Officer was placed directly under the chief of this division.

RECORD SECTION.

The loss in the Bureau of experienced clerks due to low salaries paid them has been felt acutely during the year, especially in the Record Section, but as there is no way to remedy the situation for lack of funds, the work in that section has been handled by mediocre clerks. It is, therefore, apparent that a change must be made in order to give this section its due recognition and to properly compensate the positions in it as well as the present employees who are doing their best to carry on the work, and to increase their number in order to relieve the present overburden of work and to safeguard the records of the Bureau. In other words, higher pay for positions in this section is desired in order to secure the services of experienced clerks in this line of work.

DISTRICT CLERKS.

It has been difficult to secure clerks for the district stations. Repeated efforts to secure civil service eligibles for work in the provinces have produced no results because the salary which this Bureau is authorized to pay did not appeal to these clerks. As a result, forest officers who are paid ₱90 to ₱120 a month are laboriously writing their own correspondence or else local clerks with little training have been employed on a temporary basis. Either method is wasteful but until higher pay can be offered to clerks there is no relief in sight.

GENERAL SERVICE SECTION.

The chauffeur, messengers, janitors, and watchmen come under this section. The work in this section has been carried on sa-

tisfactorily throughout the year both in the messenger service and in the maintenance and upkeep of the building and court yard of this Bureau.

It is, however, desired that funds be made available for the appointment of additional messengers as the present number of messengers allowed in this Bureau is by no means sufficient to answer the demand for messenger service in this office.

DIVISION OF ACCOUNTS AND PROPERTY.

The work of this division is carried on in three sections, namely: Auditing accounts, property, and library.

AUDITING SECTION.

An effort will be made to secure authority to appoint a clerk as chief of this section in order that the incumbent may devote all his time to his duties as cashier. The increase in the force of forest guards will necessitate an increase in the clerical force in order to expedite the issuance of pay checks and the auditing of expense accounts.

PROPERTY SECTION.

The work of receiving and distributing supplies to the field force has been carried out as well as the funds available would permit. Additional storage space was acquired but this building cannot be used to advantage until the shelves and lockers have been installed. This work will be undertaken next year if possible.

LIBRARY AND TRANSLATION SECTION.

Books have been purchased for use in the Forest School and there has been the usual addition to the library of technical journals and publications. In addition to his regular duties, the chief of this section was detailed for several months as instructor in Spanish for two days a week at the Forest School.

CONCLUSION.

The Legislature seems to have established it as a rule, in considering the budgets of the Bureau of Forestry, to take into account the amounts of forest charges collected, the result being that not only the future of this Bureau, but even its present existence and the success of the work entrusted to it, depend entirely on the collection of forest charges; if this be true, nothing can be more erroneous and unjust, if it be kept in mind that under the present system of collection, which is not under the control of this office, the Government is defrauded of over 40 per cent of the charges that should legally be collected, but

which are not collected on account of the incorrect classification of lumber within the respective groups and on account of the lack of supervision over products transported with or without the warrant of law.

The Bureau of Forestry can hardly fulfil with any satisfactory degree of efficiency the duties the law assigns to it without increasing the appropriation for personnel and running expenses and without a more direct control of the assessment and collection of forest charges, inasmuch as these latter bear a most intimate relation to the success of the work of this Bureau.

The arguments set forth during the successive preceding years by this Bureau regarding the difficulty, almost the impossibility, of retaining its personnel, technical as well as clerical, are repeated with greater emphasis this year, for the situation arising from the frequent resignations demands that preferential attention be given to the matter of the personnel of this Bureau, in order to prevent the loss of efficiency, which, with the continuance of the present state of affairs, must inevitably result.

Since 1912, when the first forest pensionados completed their two-year course of training in the Forest School at Los Baños, up to 1920, the Legislature has been appropriating the necessary amounts for the employment in the Bureau of Forestry of those who graduate every year, and it was only in the budget for 1921 that, for the first time, the necessary amounts were not provided in the appropriation for the employment of the fifteen new graduates, in spite of the fact that this appropriation was requested through several different ways.

The lack of this appropriation has entirely upset not only the future projects for the performance of which this Bureau depends upon the graduates of every year, but also the present organization, because in order to prevent the disastrous moral effect which will result in not giving employment to the new graduates after so much advertisement and efforts exerted to secure pensionados, this Bureau will be obliged to dismiss about thirty-five forest guards who are actually paid with the savings from vacant positions and whose services are likewise necessary for the scaling of logs in the sawmills and for patrol work in order to prevent caingin making and other forest violations.

Another important service which is affected by the continuous resignation of rangers is that of land classification, inasmuch as owing to the necessity of dismissing the forest guards who replaced them, a great many of the rangers selected and trained for the classification of land on a large scale will be detailed

again to the field stations and this will undoubtedly cause great delay in the certification of lands in the regions where it has been requested by the Director of Lands.

Out of the 192 rangers graduated from the Forest School at Los Baños since 1912, there remain in the service only 122, for which reason this Bureau will urgently request that University of the Philippines increase to not less than thirty-five the number of pensionados per year during a period of about five years in order to supplement the evident shortage of this personnel. For the purpose of temporarily overcoming the shortage of field personnel, this Bureau strongly recommends the approval of the plan which is now being studied to organize a body of forest guards with a total of two hundred men on a permanent basis and of third grade Civil Service standing which will be included in the appropriation estimates for next year. These guards will be detailed for patrol work and also as assistants in administrative work in order to make more efficient the collection of forest charges by a more frequent intervention of the field staff in this line of work; thus the rangers will be available for other more important technical work in the line of their training.

As regards the higher technical personnel the same recommendations given in previous years are here repeated: That the salaries of these men should be commensurate to the importance of their work and positions and must be placed in the same level as those of other scientific branches of the Government.

Finally, there is recommended a proportional increase of the clerical personnel both in number and salaries; the Forest School and the Division of Investigation should be provided with additional buildings and equipment in order to inaugurate adequately the higher course of forestry, to carry out the research work, and to provide residences for the students and faculty of the school.

RAFAEL MEDINA,
Acting Director of Forestry.

The SECRETARY OF AGRICULTURE
AND NATURAL RESOURCES,
Manila.

APPENDIX

STATISTICAL TABLES.

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certification made to the same regarding the agricultural or forest value.*

Provinces.	Received from the Bureau of Lands.									Certification made to the Bureau of Lands.			
	Pending from previous year.				During the year 1920.				Total.	Agriculture.			
	A. C.	H.	P.	L.	A. C.	H.	P.	L.		A. C.	H.	P.	L.
Abra		2	1			1	1		5		1		
Agusan		62	10	5		12			89		19	7	2
Albay		104	10			4			118		29		
Ambos Camarines		236	38	4		32			310		65	15	
Antique		36	2						38		34	2	
Bataan		44	15	6		18			83		32	4	2
Batanes						1			1				
Batangas			5						5			5	
Bohol		13	1	2		2			18		3	1	
Bukidnon		13		1					14		11		
Bulacan		4				1			5		2		
Cagayan		72	27			29			128		53	23	
Capiz		14	1			8			23		3		
Cavite													
Cebu		16	3	3					22		2	1	
Cotabato		403	10	18		6		1	438		178	2	3
Davao		279	31	65		18			393		126	21	17
Ilocos Norte		4	4						8		2	1	
Ilocos Sur		18	3			12			33		8		
Iloilo		13	4	1		1	1		20		10	1	
Isabela		130	10			19			159		89	3	
Laguna		15							15		1		
Lanao		58	5	2		21	1		87		42	4	1
La Union		33	1	1		3			38		14	1	
Leyte		192	9			21			222		46	2	
Mindoro		310	25	8		122	19		484		63	8	6
Misamis		8				3			11		4		
Mountain		32	1	1		5			39		11		
Negros Occidental		162	6	5		17		1	191		90	5	3
Negros Oriental		16	1			2			19		6		
Nueva Ecija		381	73	32		169	2	3	660		378	43	30
Nueva Vizcaya		72	10	5		28			115		58	3	2
Palawan		54	5	1		18	1		79		28		
Pampanga		50	4	1		7		1	63		33	3	1

Pangasinan	143	13	3		34			193		92	11	1
Rizal	9		1		6			16		12		
Romblon	12	4			11			27		4		
Samar	35	2			1			38		4		
Sorsogon	87	10			17	1	1	116		12	5	
Sulu					1		1	2		1		
Surigao	27	1			2			30		8		
Tarlac	22	13	1		82	5		123		38	13	
Tayabas	818	56	4		350	20	1	1,249		339	18	
Zambales	52	17	9		16			94		26	11	1
Zamboanga	146	14	2		31			193		84	12	1
Total	4,197	445	181		1,131	51	9	6,014		2,061	225	70

STATISTICAL TABLES—Continued.

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certification made to the same regarding the agricultural or forest value*—Continued.

Province.	Certification made to the Bureau of Lands.					Returned to the Bureau of Lands uncertified during the year 1920.				Total pending for inspection December 31, 1920.				
	Forestry.				Total.									
	A. C.	H.	P.	L.		H.	P.	L.	Total.	A. C.	H.	P.	L.	Total.
Abra					1						2	2		4
Agusan		3	1		32	3	1		4		49	1	3	53
Albay		22	2		53						57	8		65
Ambos Camarines		36	2		118	7	1		8		160	20	4	184
Antique		1			37						1			1
Bataan					38						30	11	4	45
Batanes											1			1
Batangas					5									
Bohol					4						12		2	14
Bukidnon					11	1			1		1		1	2
Bulacan					2						3			3
Cagayan		1			77	11	3		14		36	1		37
Capiz					3						19	1		20
Cavite														
Cebu		4			7						10	2	3	15
Cotabato					183	2			2		229	8	16	253
Davao		1	1	5	171	6	2	16	24		164	7	27	198
Ilocos Norte					3						2	3		5
Ilocos Sur		2	1		11		1		1		20	1		21
Iloilo		2	1	1	15		1		1		2	2		4
Isabela					92	1			1		59	7		66
Laguna					1	3			3		11			11
Lanao		7			54	2			2		28	2	1	31
La Union		1			16	1			1		20		1	21
Leyte		7			55	11	2		13		149	5		154
Mindoro		9			86	149	27	2	178		211	9		220
Misamis					4						7			7
Mountain		3		1	15	4			4		19	1		20
Negros Occidental		43			141	11	1		12		35		3	38
Negros Oriental		5			11	1	1		2		6			6
Nueva Ecija		25	1		477	14	2	1	17		133	29	4	166
Nueva Vizcaya					63	8		3	11		34	7		41
Palawan		3		1	32	2			2		39	6		45
Pampanga		7			44	3			3		14	1	1	16
Pangasinan		18	1		123	9			9		58	1	2	61
Rizal					12						3		1	4
Romblon		6	1		11						13	3		16

Samar		1	1		6					31	1		32
Sorsogon		31	1		49	1			1	60	5	1	66
Sulu					1							1	1
Surigao					8	1			1	20	1		21
Tarlac		7		1	59	4	2		6	55	3		58
Tayabas		137	9	1	504	45	4		49	647	45	4	696
Zambales		7	1		46	3	1		4	32	4	8	44
Zamboanga		14			111	6			6	73	2	1	76
Total		403	23	10	2,792	309	49	22	380	2,555	199	88	2,842

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certification made to the same regarding the agricultural or forest value*—Continued.

Fiscal year.	Agricultural colonies.			Homesteads.			Sales.			Leases.			Grand total.
	Agriculture.	orest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	
1905				80	6	86	8	.....	8	.....	.....	.....	94
1906				318	16	334	20	1	21	1	.....	1	356
1907				881	19	900	23	.....	23	12	.....	12	935
1908				2,456	51	2,507	49	1	50	26	.....	26	2,583
1909				1,523	187	1,710	26	3	29	27	.....	27	1,766
1910				1,175	385	1,560	34	5	39	42	2	44	1,643
1911				1,528	221	1,749	46	3	49	30	1	31	1,829
1912				2,609	301	2,910	95	11	106	47	1	48	3,064
1913				2,680	269	2,949	104	30	134	47	1	48	3,131
1913 (July 1 to December 31)				1,653	159	1,812	81	16	97	41	3	44	1,953
1914				4,812	685	5,497	279	36	315	77	1	78	5,890
1915	1,086	28	1,114	5,965	688	6,653	317	52	369	70	1	71	8,207
1916	934	41	975	6,015	670	6,685	227	18	245	55	4	59	7,964
1917	670	.....	670	7,632	797	8,429	457	27	484	118	6	124	9,707
1918	41	.....	41	5,605	621	6,226	420	33	453	109	16	125	6,845
1919	.....	.....	.....	5,256	790	6,046	431	51	482	137	22	159	6,687
1920	.....	.....	.....	2,061	403	2,464	225	23	248	70	10	80	2,792
Total	2,731	69	2,800	52,249	6,268	58,517	2,842	310	3,152	909	68	977	65,446

NOTE.—A. C. = Agricultural Colony of 16 hectares lot; H. = Homestead; P. = Purchase; L. = Lease.

SUMMARY.

Applications on hand during 1920		6,014
Certified for agriculture	2,356	
Certified for forestry	436	
Returned uncertified	380	
		3,172
Total pending December 31, 1920		2,842

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1920.*

Species.	Fiscal year—			
	1910	1911	1912	1913
Red Lauan				
White Lauan	43,439	46,942	57,036	81,469
Apitong	20,764	21,096	28,929	32,391
Tangile	2,106	2,762	3,999	5,249
Guijo	14,107	14,231	18,579	17,279
Yakal	8,225	8,150	14,491	21,770
Ipil	13,717	12,296	17,237	15,791
Molave	8,923	7,978	9,091	9,363
Narra	5,744	4,996	8,474	8,877
Kalantas	3,174	1,368	938	3,320
Palosapis				
Manggachapuy				
Dungon	2,453	1,693	1,213	931
Tindalo	954	1,018	794	932
Akle	809	867	1,295	1,690
Lumbayao				
Pagatpat				
Other species:				
First group	574	322	707	1,000
Second group	1,667	6,644	7,988	8,543
Third group	8,316	10,927	11,796	8,711
Fourth group	36,786	41,655	42,981	59,855
Total	176,758	182,945	225,548	277,171

Species.	July 1 to December 31, 1913.	Fiscal year—		
		1914	1915	1916
Red Lauan				
White Lauan	20,249	74,453	73,277	107,634
Apitong	12,905	32,328	38,849	56,529
Tangile	3,390	14,682	15,460	28,961
Guijo	7,841	19,701	15,650	16,685
Yakal	5,593	15,115	14,714	16,471
Ipil	7,535	17,602	12,089	14,147
Molave	4,783	9,753	10,546	10,788
Narra	3,941	8,467	9,868	7,970
Kalantas	886	2,423	1,999	4,574
Palosapis		2,222	1,631	2,723
Manggachapuy		1,469	1,859	2,666
Dungon	601	2,199	1,467	1,127
Tindalo	484	914	1,181	1,115
Akle	729	1,287	1,498	1,088
Lumbayao				
Pagatpat				
Other species:				
First group	687	2,196	2,190	3,074
Second group	3,266	9,373	6,940	7,938
Third group	2,999	7,557	6,920	5,214
Fourth group	25,613	73,017	60,130	56,738
Total	101,502	294,758	276,268	341,442

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1920*—Continued.

Species.	Fiscal year—				Total, 1910 to 1920.
	1917	1918	1919	1920	
Red Lauan				52,294	52,294
White Lauan	131,699	108,900	180,556	119,833	1,045,487
Apitong	55,335	56,274	72,223	99,775	523,398
Tangile	25,389	21,775	35,005	40,903	199,681
Guijo	16,857	17,301	25,924	28,413	212,568
Yakal	11,963	9,162	18,100	20,317	164,071
Ipil	16,629	15,498	18,926	24,720	186,187
Molave	13,582	22,233	26,088	30,173	163,301
Narra	5,904	7,848	11,152	12,711	95,952
Kalantas	7,381	4,975	5,040	8,622	44,700
Palosapis	3,042	8,863	15,661	7,594	41,736
Manggachapuy	2,916	2,214	3,096	3,094	17,314
Dungon	1,592	1,318	1,839	2,607	19,040
Tindalo	1,145	826	1,080	1,387	11,830
Akle	798	870	937	2,047	13,915
Lumbayao	6,085	4,415	4,192	7,550	22,242
Pagatpat	1,502	849	2,766	4,743	9,860
Other species:					
First group	1,084	1,416	3,335	9,104	25,689
Second group	6,432	7,779	12,084	17,414	101,068
Third group	9,895	8,611	53,513	1,978	136,437
Fourth group	47,661	80,933	3,711	59,718	588,798
Total	366,891	382,060	495,228	554,997	3,675,568

TABLE NO. 3.—*Revenues derived from the sale of forest products and expenditures of the Bureau of Forestry since its organization, April 14, 1900.*

Fiscal year.	Revenue.	Expense.	Surplus.	Expense.
				Per cent.
1901 to 1906	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913	390,664	227,048	163,616	59
1913 (July to December 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
1917	536,328	281,126	255,202	53
1918	650,692	334,254	316,438	51
1919	805,229	473,242	331,986	58
1920	1,009,879	541,488	468,390	54
Total	8,800,282	4,774,868	4,025,412	54.25

TABLE NO. 4.—*Revenues from sale of forest products, January 1 to December 31, 1920.*

Province.	Charges on forest products.								
	Timber.				Firewood.		Minor products.	Lease of forest lands.	Total.
	First group, ₱2.50 per cubic meter.	Second group, ₱1.50 per cubic meter.	Third group, ₱1 per cubic meter.	Fourth group, ₱0.50 per cubic meter.	Bacauan and tangal, ₱0.20 per cubic meter.	Other, ₱0.10 per cubic meter.			
Abra	₱3,452.25	₱1,276.05	₱694.73	₱237.28	₱32.76	₱122.50	₱191.60	.....	₱6,007.17
Agusan	4,645.88	59.55	16.74	62.31	2.20	.....	1,066.23	.....	5,852.91
Albay	8,478.07	3,701.78	4,442.51	1,877.29	777.54	445.40	6,333.57	.....	26,056.16
Ambos Camarines (first quarter only)	627.68	717.52	944.94	749.12	484.10	164.17	2,967.23	.....	6,654.76
Antique	483.62	16.91	107.19	71.08	20.00	36.44	396.96	.....	1,132.20
Bataan	449.59	2,579.11	9,054.52	7,262.74	599.34	1,220.86	2,938.94	.....	24,105.10
Batangas	1,766.54	963.14	102.84	381.30	131.67	1,281.59	2,886.27	.....	7,513.35
Bohol	1,099.27	222.33	139.08	311.07	1,151.68	925.15	927.46	.....	4,776.04
Bukidnon	311.65	1.76	7.19	.....	31.44	.....	67.86	.....	419.90
Bulacan	3,305.45	3,296.14	3,265.67	2,467.58	74.56	67.77	1,102.02	.....	13,579.19
Cagayan	21,771.14	1,965.48	3,887.89	577.81	420.69	292.90	4,724.32	.....	33,640.23
Camarines Norte	628.97	613.01	1,461.95	446.38	495.23	16.38	3,577.50	.....	7,239.42
Camarines Sur	1,055.41	955.69	1,740.51	1,236.17	391.86	393.75	7,932.20	.....	13,705.59
Capiz	607.76	366.04	1,776.78	1,828.03	3,024.89	832.83	1,063.31	.....	9,498.64
Cavite	15.60	61.85	2.75	20.15	.....	135.70	1,222.81	.....	1,458.86
Cebu	1,198.96	251.08	541.47	470.57	3,735.30	1,717.79	4,335.31	₱86.81	12,337.29
Cotabato	15,966.97	13,036.78	1,137.69	1,321.14	2,276.73	37.32	5,309.51	.....	39,086.14
Davao	5,012.75	2,791.27	4,928.54	6,092.64	547.30	401.14	4,281.91	.....	24,055.55
Ilocos Norte	1,121.85	562.32	309.00	223.53	61.84	78.92	95.67	.....	2,453.13
Ilocos Sur	262.46	21.26	25.35	15.92	2.80	93.73	247.28	.....	668.80
Iloilo	7,924.40	3,796.18	2,755.38	1,342.61	2,692.74	2,618.58	4,341.79	16.58	25,488.26
Isabela	6,141.50	1,626.38	1,145.29	317.18	28.13	98.04	42.92	.....	9,399.44
Laguna	216.11	942.61	2,861.51	627.80	23.70	546.10	1,589.95	.....	6,807.78
Lanao	583.32	116.42	381.17	163.20	.....	57.58	186.29	.....	1,487.98
La Union	423.04	168.31	219.84	24.00	.....	5.32	284.47	.....	1,124.98
Leyte	8,165.13	1,838.51	7,053.72	3,033.27	1,490.21	64.98	4,471.55	.....	26,117.37
Manila	93,333.39	15,575.38	120,803.84	55,919.69	1,901.61	2,065.69	9,652.70	141.71	299,394.01
Marinduque	187.05	231.94	56.88	13.39	181.58	54.52	269.60	.....	994.96
Mindoro	4,044.56	1,464.86	655.32	1,367.37	762.40	404.87	2,855.78	.....	11,555.16
Misamis	1,294.91	1,442.17	2,735.01	1,065.86	92.25	197.90	1,737.82	.....	8,565.92
Mountain Province	1,940.79	294.62	5,976.20	226.88	.....	1,615.90	539.00	.....	10,593.39
Negros Occidental	7,295.74	6,273.71	5,039.30	5,813.14	1,462.57	777.94	5,488.61	.....	32,151.01
Negros Oriental	2,036.23	612.89	465.73	315.13	78.12	248.60	3,244.98	.....	7,001.68
Nueva Ecija	4,008.70	1,460.26	91.63	94.87	7.88	105.70	2,918.87	.....	8,687.91
Nueva Vizcaya	152.73	17.96	2.55	.....	9.00	.....	117.77	.....	300.01
Palawan	7,401.11	1,486.83	148.95	1,404.28	272.33	280.16	2,358.69	.....	13,352.35
Pampanga	429.68	1,386.93	5,011.53	2,139.90	167.73	1,104.70	918.75	.....	11,159.22

TABLE NO. 4.—*Revenues from sale of forest products, January 1 to December 31, 1920*—Continued.

Province.	Charges on forest products.								
	Timber.				Firewood.		Minor products.	Lease of forest lands.	Total.
	First group, ₱2.50 per cubic meter.	Second group, ₱1.50 per cubic meter.	Third group, ₱1 per cubic meter.	Fourth group, ₱0.50 per cubic meter.	Bacauan and tangal, ₱0.20 per cubic meter.	Other, ₱0.10 per cubic meter.			
Pangasinan	₱8,481.60	₱4,779.97	₱3,889.17	₱1,321.41	₱1,245.37	₱799.37	₱1,582.87	.....	₱22,099.76
Rizal	241.82	351.22	212.09	521.06	10.00	1,165.73	2,743.25	.....	5,245.17
Romblon	2,139.66	1,469.01	120.68	145.94	.....	32.29	897.24	.....	4,804.82
Samar	6,738.93	1,651.33	2,952.25	1,151.16	357.85	296.38	8,251.90	.....	21,399.80
Sorsogon	25,405.44	4,656.05	3,484.27	6,601.48	2,244.26	488.66	4,587.57	₱100.00	47,567.73
Sulu	14,020.03	1,839.86	944.73	379.48	1,177.73	146.00	292.23	.....	18,800.06
Surigao	1,895.35	486.20	415.33	254.59	60.06	.....	3,625.82	.....	6,746.35
Tarlac	925.44	227.54	55.54	63.46	.....	35.94	515.45	.....	1,823.37
Tayabas	52,612.96	4,391.04	5,797.62	2,307.45	6,771.60	8,711.18	23,400.89	10.50	104,003.24
Zambales	1,871.10	2,981.53	5,826.34	1,314.89	580.35	599.33	1,318.95	.....	14,492.49
Zamboanga	8,437.22	5,744.55	20,505.23	6,582.08	1,776.15	738.52	4,690.73	.....	48,474.48
Total charges	309,803.93	90,737.16	221,266.90	107,113.12	33,632.72	25,600.09	128,814.36	355.60	917,323.88
Total fines and penalties	30,805.88	10,036.17	12,926.54	13,050.56	4,031.88	5,924.23	15,780.04	.....	92,555.25
Grand total	340,609.81	100,773.33	234,193.44	120,163.68	37,664.55	31,524.32	144,594.40	355.60	1,009,879.13

TABLE No. 5.—*Timber licenses in force during fiscal year 1920 (January 1, to December 31).*

Province.	Timber licenses.					Gratuitous licenses.				
						For personal use.				
	For less than 100 cubic meters.	For 100 cubic meters and less than 1,000 cubic meters.	For 1,000 cubic meters and over.	License agreements.	Total commercial licenses.	Inside communal forest.	Outside communal forest.	For public works.	Miner's gratuitous licenses.	Total.
Abra	27	63			90	35	12	1		48
Agusan	1	15	9	1	26	11	77	2	1	91
Albay	5	27	16		48	22	83	2		107
Antique	3	11			14	3	2	2		7
Bataan	38	14	35	2	89			2		2
Batangas	2	12	2		16		3	2		5
Bohol	18	11	1		30	168	13	2		183
Bukidnon			2		2	2	10	2		14
Bulacan	4	62	9		75		5	2	10	17
Cagayan	3	118	18		139	60	9	3	1	73
Camarines Norte	3	35	5		43	5	2	2	13	22
Camarines Sur	7	40	4	1	52	4	8	2	13	27
Capiz	8	71	1		80	17	7	2		26
Cavite	1				1		1	2		3
Cebu	14	22	2		38	15	38	2	2	57
Cotabato	2	2	6		10			2		2
Davao	27	37	19		83		31	2		33
Ilocos Norte	29	38	6		73	28		4		32
Ilocos Sur	8				8	12		4		16
Iloilo	6	30	3		39	1	5	2		8
Isabela	6	67	3		76	77	4	3		84
Laguna	12	48	5		65		13	2		15
Lanao		6	7	1	14			2		2
La Union	5	8			13	33		2		35
Leyte	34	76	6		116	128	212	2		342
Marinduque		14	1		15	12	1			13
Mindoro	10	48	34		92	1	15	2		18
Misamis	2	14	4		20	46	14	2		62
Mountain Province	65	37	15	2	119	9	18	6	3	36
Nueva Ecija	3	36	5		44	95	1	3		99
Nueva Vizcaya	16	8	2		26	11	17	3		31
Occidental Negros	2	48	26	2	78	6	1	2		9
Oriental Negros	1	12	5		18	4	8	2		14
Palawan	22	3	30		55		13	2		15
Pampanga		14	5		19		1	2		3
Pangasinan	6	97	11		114	184	8	2		194
Rizal	3	16	2		21		2	2		4
Romblon	2	11	1		14	6	20	2		28

TABLE No. 5.—*Timber licenses in force during fiscal year 1920 (January 1 to December 31)*—Continued.

Province.	Timber licenses.					Gratuitous licenses.				
						For personal use.				
	For less than 100 cubic meters.	For 100 cubic meters and less than 1,000 cubic meters.	For 1,000 cubic meters and over.	License agreements.	Total commercial licenses.	Inside communal forest.	Outside communal forest.	For public works.	Miner's gratuitous licenses.	Total.
Samar	49	46	10	.....	105	185	39	2	.....	226
Sorsogon	10	81	43	.....	134	16	29	2	10	57
Sulu	.....	1	4	.....	5	.....	.....	2	.....	2
Surigao	36	24	5	.....	65	88	169	2	3	262
Tarlac	.....	14	2	.....	16	81	3	2	.....	86
Tayabas	17	85	72	1	175	32	3	2	6	43
Zambales	10	30	12	1	53	32	54	2	.....	88
Zamboanga	17	18	25	5	65	52	94	3	1	150
All provinces	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Total	534	1,470	473	15 ~~16~~	2,493	1,481	1,045	103	63	2,692
Total..1919	1,078	1,543	315	14	2,950	547	605	200	63	1,415
Difference	—544	—73	+158	~~+2~~ 1	—457	+934	+440	—97	.....	+1,277

NOTE: + = increases; — = decreases.

In Cagayan, Isabela, Abra, La Union, Mountain Province, Nueva Vizcaya, Pangasinan, and Tarlac, 728 licenses were issued for building tobacco curing houses.

TABLE NO. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1920 (January 1 to December 31).*

Province.	Timber.					Firewood class.		Charcoal.	Dyewood.
	Group.				Total.				
	First.	Second.	Third.	Fourth.		First.	Second.		
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*
Abra	1,006	731	490	365	5,292	23	2,460	.....	.....
Agusan	1,870	105	23	49	2,047	.....	34	2	.....
Albay	2,355	1,801	3,190	1,358	8,704	2,315	1,733	11	.....
Antique	59	63	20	65	207	92	52	.....	.....
Bataan	86	4,082	41,255	31,538	76,961	2,817	17,083	1,065	.....
Batangas	191	63	14	68	336	8	19,888	.....	.....
Bohol	258	102	209	502	1,071	20,679	12,161	3	.....
Bukidnon	163	16	5	5	189	.....	.....	.....	.....
Bulacan	908	1,688	1,933	3,133	7,662	73	722	495	.....
Cagayan	7,655	746	3,365	836	10,002	438	2,033	.....	.....
Camarines Norte	261	229	1,652	524	2,666	3,164	3,289	.....	.....
Camarines Sur	1,646	2,100	10,311	2,748	16,805	1,190	2,892	.....	.....
Capiz	112	171	1,897	1,315	3,495	11,025	11,038	484	.....
Cavite	.....	.....	.....	25	25	.....	9,597	19	.....
Cebu	152	66	41	176	435	235	10,276	8	.....
Cotabato	4,079	4,946	1,229	1,834	12,088	355	1,884	.....	.....
Davao	502	496	471	1,784	3,253	1,133	422	35	.....
Ilocos Norte	416	412	301	459	1,588	88	329	2	.....
Ilocos Sur	35	6	4	17	62	.....	130	.....	146
Iloilo	306	504	348	630	1,788	10,312	21,817	366	1,021,616
Isabela	2,001	907	1,028	503	4,439	.....	634	.....	.....
Laguna	38	502	2,774	1,019	4,333	30	6,338	1,168	.....
Lanao	119	337	23,194	10,485	34,135	13	229	5	.....
La Union	149	91	91	18	349	.....	23	.....	27,305
Leyte	2,286	656	3,057	3,108	9,107	4,607	815	58	.....
Marinduque	67	93	74	16	250	5,304	3,158	.....	.....
Mindoro	4,111	5,576	2,955	2,171	14,813	13,890	7,862	.....	400
Misamis	495	310	1,382	653	2,840	271	936	.....	.....
Mountain Province	910	400	6,416	85	7,811	.....	9,503	.....	.....
Negros Occidental	3,150	2,245	40,107	79,737	125,239	8,114	4,763	52	.....
Negros Oriental	937	658	327	413	2,335	70	710	.....	.....
Nueva Ecija	945	834	164	186	2,129	.....	4,522	67	.....
Nueva Vizcaya	63	7	29	34	133	.....	298	.....	.....
Palawan	22,028	2,614	251	721	25,614	161	42	.....	.....
Pampanga	42	635	970	455	2,102	222	4,477	305	.....
Pangasinan	2,387	3,199	3,274	1,023	9,883	7,775	6,495	250	.....
Rizal	33	89	68	472	662	.....	29,240	2,792	.....
Romblon	644	447	95	139	1,325	206	158	.....	.....

TABLE No. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1920 (January 1 to December 31)*—Continued.

Province.	Timber.					Firewood class.		Charcoal.	Dyewood.
	Group.				Total.				
	First.	Second.	Third.	Fouth.		First.	Second.		
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*
Samar	2,260	614	1,378	1,015	5,267	3,142	116		
Sorsogon	12,698	3,281	2,719	4,741	23,439	6,256	4,764	2	
Sulu	3,528	881	681	363	5,453	2,809	4	250	
Surigao	605	326	441	191	1,563	2,058	440	20	
Tarlac	265	109	31	76	481	6	350	89	
Tayabas	21,915	2,297	24,201	3,347	51,760	481,718	49,790	506	
Zambales	654	1,849	6,709	3,902	13,114	2,243	4,023	36	
Zamboanga	4,691	4,244	25,663	17,247	51,845	4,945	1,714	39	
Total	109,081	51,528	214,837	179,551	554,997	597,787	259,294	8,129	1,049,467
Total, 1919	84,658	42,943	194,838	172,789	495,228	138,649	251,856	5,264	1,794,784
Difference	+24,423	+8,585	+19,999	+6,762	+59,769	+459,138	+7,438	+2,865	—745,317

Province.	Tanbark.	Wood-oils.	Copal (Almáciga).	Daluru.	Gutta-percha.	Split rattan.	Unsplit rattan.		Diliman.
							Over 2 cm. in diameters.	2 cm. in diameters or less.	
	Kilos.	*Liters.*	*Kilos.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Lin. m.*	*Lin. m.*	*Kilos.*
Abra							172,464	18,000	
Agusan						38,990	1,200		1,330
Albay	9,039					80,370	26,000		
Antique						6,010	280		1,870
Bataan	622					80,058	557,907	65,000	2,953
Batangas	81,766		414			332			
Bohol	3,735					407			174
Bukidnon						394			
Bulacan	3,800					6,423	480,078	153,680	
Cagayan		100				116,978	390,143	17,194	
Camarines Norte	7,341					212,244			240
Camarines Sur	176,727		342,277			283,504	231,669		616
Capiz				8		2,064			
Cavite	12,567								
Cebu	1,904					1,257			150
Cotabato	4,164				348,636	1,306			
Davao	100	286	595,621			1,393	182,418		

Ilocos Norte	6,040					4,006	1,600		
Ilocos Sur									
Iloilo	172,294		175			4,564			510
Isabela							92,273	4,000	
Laguna	16,213					26,439	21,480		15,613
Lanao					340	1,257	7,000		1,597
La Union									
Leyte	184	18,840				104,941	54,915	2,075	19,698
Marinduque						541			8,897
Mindoro	81,102					64,398	11,640		28,467
Misamis	20		6,623			4,951			1,938
Mountain Province						8,732	6,000		
Negros Occidental		10,857				21,572	21,300		1,151
Negros Oriental		11,995				120,899	9,300		1,060
Nueva Ecija	3,299						326,240	50,165	
Nueva Vizcaya							7,200	200	
Palawan	68,629		140,154			8,514	471,447		
Pampanga				247		3,067	2,600		600
Pangasinan	32,710						64,700		
Rizal	5,704					46,275	9,675		1,267
Romblon		200	6,928			1,589			
Samar	130,831	812				213,253	79,077		5,270
Sorsogon	19,430	9,365	4,935			19,498			12,390
Sulu	3,000		150			660			
Surigao	28,737	375				167,396	26,835		
Tarlac	10,573		764			9,907	3,100	77,250	
Tayabas	31,423		732,354			441,602	912,603	1,334,990	4,172
Zambales	11,020			8		11,867	120,650	993,033	
Zamboanga	234,601		11,001		7,592	27,867	97,320		
Total	1,157,575	52,820	1,841,396	263	356,568	2,153,025	4,389,114	2,716,587	109,963
Total, 1919	1,780,705	109,536	1,092,823	283	20,693	3,059,936	2,550,229	15,248,237	120,700
Difference	—623,130	—56,706	+748,573	—20	+335,875	—906,911	+1,838,885	—12,531,650	—10,737

NOTE: + = increases; — = decreases.

TABLE NO. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1920 (January 1 to December 31)*—Continued.

Province.	Lime-stone.	Gogo.	Stone and sand.	Buri.	Guano.	Earth.	Nipa.	Dyebark.	Cabo negro.
	Kilos.	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Cu. m.*	*Shingles.*	*Kilos.*	*Kilos.*
Abra	6,000								
Agusan									
Albay			3						
Antique									
Bataan		1,080							
Batangas	207,250	32,605		5,662				1,500	
Bohol		291		130				4	
Bukidnon									
Bulacan		50							
Cagayan		250							
Camarines Norte	10,500		700						
Camarines Sur								80	
Capiz				19,280				1,426	
Cavite		33,907							
Cebu				80,282				265	
Cotabato									
Davao									
Ilocos Norte								2,808	
Ilocos Sur	74,795		49,278						
Iloilo		218			5				
Isabela									
Laguna		159				1,800			
Lanao							11,800		
La Union									
Leyte			810					223	
Marinduque								605	
Mindoro		903		18,786				11,016	
Misamis								740	
Mountain Province	160,100		810			11			
Negros Occidental		726							120
Negros Oriental		9,345						1,736	
Nueva Ecija		5,134		470,020				100	
Nueva Vizcaya									
Palawan		23,159						29,936	
Pampanga		790		61,954					
Pangasinan		630		3,948					
Rizal		745		27,134				1,277	
Romblon									
Samar								155	
Sorsogon		4,915		5,334				19,565	
Sulu									

Surigao	.....	.....	212	.....	.....	.....	.....	.....	.....
Tarlac	.....	1,654	.....	18,385	.....	.....	.....	.....	.....
Tayabas	.....	96	.....	274,974	211	.....	.....	5,311	.....
Zambales	.....	9,541	.....	.....	.....	.....	.....	.....	.....
Zamboanga	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	458,645	126,198	51,813	985,889	216	1,811	11,800	75,747	120
Total, 1919	288,112	130,127	118,290	39,946	.....	.....	.....	64,866	.....
Difference	+170,533	—3,929	—66,477	+945,943	.....	.....	.....	+10,881	.....

NOTE: + = increases; — = decreases.

TABLE No. 6–B.—*Statement of forest products, cut or gathered from registered private woodlands during fiscal year 1920.*

Province.	Timber.					Firewood.		Charcoal.	Tanbark.	Gogo.	Dyebark.	Split rattan.	Rattan over 2 centimeters in diameter.	White earth Balls.	Daluru.
	First group.	Second group.	Third group.	Fourth group.	Total.	First class.	Second class.								
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Linear meters.*		*Cu. m.*
Albay		52	155	49	256		25								
Bataan		1	112	6	119		544	1							
Batangas				14	14	4,250	1,825		3						
Bulacan	7				7	2,743	301								
Capiz						1,051	228								
Cavite							1,877	40		507					
Ilocos Norte	25	36	2	58	121										
Iloilo						28	878	66							
Laguna						83	17,053	2,053	3,950				16,000	11,300	
Mindoro	14	52	22	29	117										
Negros Occidental	14	84	781	1,005	1,884		2,028								
Negros Oriental	37				37										
Nueva Ecija	23	4		12	39		333	1		1,860		9,057			
Palawan											4,375				
Pampanga				22	22	9,525	7,735	2,664							57
Rizal	68	4	5	24	101		14,197	35	6,976		711	120			
Tarlac	144	4	6	11	165		5,042	365				750	12,100		
Tayabas	10				10										
Total	342	237	1,083	1,230	2,892	17,680	52,066	5,225	10,929	2,367	5,086	9,927	28,100	11,300	57

TABLE NO. 7.—*Minor products licenses in force during fiscal year 1920 (January 1, to December 31).*

Province.	Firewood.	Charcoal.	Dyewood.	Tanbarks and dyebark.	Wood oils.	Almaciga, resins and others.	Gutta-percha.	Bejuco and diliman.	Gogo.	Sand gravel and stone.	Others.	Total.
Abra	16							13				29
Agusan	6	1				1		46			2	56
Albay	42			2		2		51				97
Antique	2			1		1		22				26
Bataan	30	14			1	4		69	12			130
Batangas	11			6						4		21
Bohol	17											17
Bukidnon	1					1		13				15
Bulacan	5	12		1				35	1			54
Cagayan	29			3	1	6		104				143
Camarines Norte	31	1		2	1	11		88	1	3		138
Camarines Sur	39	1		3		18		98		5		164
Capiz	47	4		3				8			2	64
Cavite	8	1		2					10			21
Cebu	40	1									7	48
Cotabato	14			3	6	10	11	8			12	64
Davao	34	4			9	10	1	13		1	8	80
Ilocos Norte	14			1				6		3		24
Ilocos Sur	6	1		2				1		21		31
Iloilo	79	10	23	10	2			10			7	141
Isabela	13					4		29				46
Laguna	11	5		3		4		27	3		12	65
Lanao	7			1		3	2	10			7	30
La Union	1			1								2
Leyte	45	2		1	5			48		8		109
Marinduque	9			3		4		8	1			25
Mindoro	43			20		4		83	22		5	177
Misamis	14			1	1	3	2	20			2	43
Mountain Province	30			2		1		36		13		82
Nueva Ecija	13	3		2				48	23		18	107
Nueva Vizcaya	5					1		18				24
Occidental Negros	59				24	2		161	20	1	11	278
Oriental Negros	12					6		50	9			77
Palawan	55		1	30	3	18		47	10		7	171
Pampanga	12	7						9	3		4	35
Pangasinan	42	4	3	18				5	5		3	80
Rizal	37	10		4				18	9		1	79
Romblon	4				5	8		4			8	29
Samar	38			4	5	1		76				124
Sorsogon	58			11	5	7		76	3		4	164
Sulu	2	1										3
Surigao	25	4		6	1			28		2	1	67
Tarlac	12	3		2		3		15	9		4	48

TABLE No. 7.—*Minor products licences in force during fiscal year 1920 (January 1, to December 31)*—Continued.

Province.	Firewood.	Charcoal.	Dyewood.	Tanbarks and dyebark.	Wood oils.	Almaciga, resins and others.	Gutta-percha.	Bejuco and diliman.	Gogo.	Sand gravel and stone.	Others.	Total.
Tayabas	87	7	.....	19	.....	90	.....	142	16	3	27	391
Zambales	47	7	.....	9	1	7	.....	42	8	.....	9	130
Zamboanga	42	5	.....	12	2	18	17	61	.....	.....	5	162
Total	1,194	108	27	188	72	248	33	1,646	165	64	166	3,911
Total, 1919	1,665	175	44	336	71	263	28	2,055	291	.....	255	5,179
Difference	—471	—67	—17	—148	+1	—15	+5	—409	—126	.....	—89	—1,268

NOTE: + = increases; — = decreases.

TABLE NO. 8.—*Statement showing the quantity and value of minor forest products exported during the fiscal year 1920 (January 1 to December 31).*

	Kilos.	Value.
Copal (almáciga):		
United States	454,308	₱177,716
United Kingdom	243,889	76,103
Belgium	3,325	1,304
France	83,230	28,790
Spain	6,900	2,400
British East Indies	203,126	73,035
Japan	18,548	6,591
Australasia	6,508	1,725
Total	1,019,834	367,664
Elemi (pili resin):		
United States	244,507	233,070
United Kingdom	41,021	42,367
Belgium	11,817	10,514
France	16,717	10,895
Germany	4,541	2,842
Spain	4,500	3,400
British East Indies	465	1,940
Hongkong	4,560	6,000
Total	328,308	311,028
Gutta-percha:		
United States	170	2,000
British East Indies	77,914	99,383
Total	78,084	101,383
Rubber:		
United States	57,232	85,300
Spain	860	2,000
British East Indies	1,872	2,250
Total	59,964	89,550
Lumbang (candle nut) oil:		
United States	156,308	114,072
United Kingdom	755	906
Spain	1,411	1,349
Total	158,474	116,327
Sappan wood (sibukau):		
China	219,604	14,276
Hongkong	711,845	27,371
Total	931,449	41,647
Total		1,027,599

TABLE No. 9.—*Statement of appropriation and expenditures, Bureau of Forestry (January 1 to December 31, 1920).*

Appropriation:		
Act No. 2875		₱565,000.00
Expenditures:		
Salaries and wages	₱326,177.17	
Bonus	61,616.38	
Furniture and equipment	19,968.29	
Traveling expenses of personnel	62,488.82	
Rentals of buildings and grounds	8,799.47	
Freight, express and delivery service	2,857.68	
Printing and binding reports, documents and publications	5,000.00	
Postal, telegraph and cable service	8,193.57	
Illumination and power service	4,151.07	
Plant and equipment repair service	1,802.49	
Contingent service	2,876.28	
Consumption of supplies and materials	37,207.31	
Traveling expense of persons not Government employees	350.00	
Total expenditures		541,488.53
Balance January 1, 1921		23,511.47
Appropriation for construction of a fire-proof vault (Act No. 1786):		
Balance January 1, 1920		2,307,17
Expenditures		290.31
Balance January 1, 1921		2,016.88
Appropriation for construction of three forest stations (Act No. 2786)		5,000.00
Expenditures		4,961.71
Balance January 1, 1921		38.29
Appropriation for installation of an electric lighting system, Los Baños (Act No. 2876)		6,000.00
Expenditures		5,957.83
Balance January 1, 1921		42.17
Appropriation for purchase and installation of a still for water, Los Baños (Act No. 2898)		4,000.00
Expenditures		2,524.89
Balance January 1, 1921		1,475.11
Statement of Bureau of Forestry appropriations, expenditures and revenues for fiscal year 1920:		
Appropriation		565,000.00
Revenue		1,009,879.13
Expenditures		541,488.53
Surplus		468,390.60
Percentage of expenditures to revenue		.54

DIRECTORY OF THE BUREAU OF FORESTRY

ARTHUR F. FISCHER, *Director.*

DIVISION OF FOREST MANAGEMENT.

Fred L. Pray	Forester, Chief.
Ramon J. Alvarez	Forester, Assistant chief.
Florencio Tamesis [1]	Assistant Forester.
Porfirio San Buenaventura	Forest supervisor.
Agapito L. Cenabre	Forest supervisor.
Felix Franco [1]	Forest supervisor.
Eladio C. Leaño	Forest supervisor.
Nazario Peñas [1]	Forest supervisor.
Apolinario Suyat	Forest supervisor.
Carlos Guerrero	Ranger.
Miguel Pajarillo	Junior stenographer.

LICENSE SECTION.

Juan Lopez	Forest supervisor, In charge.
Petronilo Cortes	Ranger.
Leonardo Laguio	Ranger.
Eufemio Santillan	In charge of clerks.
Agustin Baula	Clerk (Ty.)
Enrique Baña	Clerk.
Fausto Pe Benito	Clerk.
Melanio Espiritu	Clerk.
Arcadio Gepiga	Clerk.
Luis S. Mabagos	Clerk.
Avelino Rivera	Clerk
Tomasa Buensuceso (Miss)	Junior stenographer.

WOOD EXPERT SECTION.

Edwin E. Schneider	Wood expert, Chief.
Luis J. Reyes [1]	Ranger, Assistant chief.
Justo M. Pascual	Ranger.
Alberto Barros	Ranger.
Luis Adona	Ranger.
Aurelio Maglunog	Clerk.
Andres G. Ferrer	Clerk.

DISTRICT No. 1.

[Provinces: Cagayan, Isabela and Mountain Province (Apayao) and Kalinga.]

Forest Station at Aparri, Cagayan (district headquarters):

Pastor de la Peña	Officer in charge.
Francisco Siriban	Ranger.

[1] Government pensionados studying in the United States.

Forest Station at Aparri, Cagayan (district headquarters)—Continued.
Felipe T. Pattagulan ..... Clerk.
Ambrosio Bitonio ..... Forest guard.
Forest Station at Ilagan, Isabela:
Mamerto Azurin ..... Officer in charge.
Forest Station at Tuguegarao, Cagayan:
Deogracias Guzman ..... Officer in charge.
Forest Station at Echague, Isabela:
Vicente Velasco ..... Officer in charge.
Forest Station at Claveria, Cagayan:
Luis Aguilar ..... Officer in charge.

DISTRICT No. 2.

[Privinces: Ilocos Norte, Ilocos Sur, and Abra.]

Forest Station at Vigan, Ilocos Sur (district headquarters):
Espiritu Paraiso ..... Officer in charge.
Ambrosio Damo ..... Ranger
Ponciano Pacada ..... Forest guard.
Zoilo Sambrano ..... Forest guard.
Forest Station at Bangued, Abra:
Cayetano Barros ..... Officer in charge.
Juan Balbuena ..... Forest guard.

DISTRICT No. 3.

[Provinces: Mountain Provinces, Benguet, Bontoc, and Amburayan.]

Forest Station at Baguio, Benguet (district headquarters):
Mauricio J. Oteyza ..... District forester.
Vicente J. Defensor ..... Ranger.
Edilberto Madrid ..... Ranger.
Jose Medina ..... Ranger.
Francisco Bagaui ..... Forest guard.
Aquilino Balbin ..... Forest guard.
Luis Chigas ..... Forest guard.
Esteban Fontanilla ..... Forest guard.
Silverio Gapuz ..... Forest guard.
Pedro Gacad ..... Forest guard.
Pastor Gracia ..... Forest guard.
Timoteo Lagasca ..... Forest guard.
Miguel Mangabat ..... Forest guard.
Valentin Ulep ..... Forest guard.

DISTRICT No. 4.

[Provinces: Pangasinan, Nueva Ecija, Nueva Vizcaya, Tarlac, and Northern Zambales.]

Forest Station at Dagupan, Pangasinan (district headquarters):
Benigno Alejandro ..... Officer in charge.
Juan Acenas ..... Ranger.
Marcial Agayan ..... Forest guard.
Canuto Ducusin ..... Forest guard.
Gregorio Valenzuela ..... Forest guard.
Irineo Lopez ..... Clerk.
Forest Station at Cuyapo, Nueva Ecija:
Manuel Montalvo ..... Officer in charge.
Amando Curaming ..... Ranger.
Anselmo Agustin ..... Forest guard.
Victorino Mariano ..... Forest guard.

Forest Station at Bayombong, Nueva Vizcaya:
- Pedro Afalla — Officer in charge.
- Protacio Taboy — Forest guard.
- Gerardo S. Maraña — Forest guard.

DISTRICT No. 5.

[Provinces: Batangas, Laguna, Tayabas, and Marinduque.]

Forest Station at Los Baños, Laguna (district headquarters):
- Lyman H. Taft, Jr. — District forester.
- Pedro P. Lasquety — Ranger.
- Pioquinto de la Vega — Ranger.
- Justino Mahupil — Clerk.
- Cirilo Cabauatan — Forest guard.
- Ildefonso C. Ferrer — Forest guard.
- Lorenzo Onofre — Forest guard.
- Pedro Redondo — Forest guard.

Forest Station at Calauag, Tayabas:
- Braulio Cristobal — Officer in charge.
- Gregorio Arizabal — Ranger.
- Albino Labaco — Forest guard.
- Castor Jundak — Forest guard.

Forest Station at Infanta, Tayabas:
- Mauro S. Baculi — Officer in charge.
- Gregorio Mopera — Forest guard.

Forest Station at Laguimanoc, Tayabas:
- Julio Baldemor — Officer in charge.
- Felix Dayao — Forest guard.
- Victor Gaboco — Forest guard.
- Eusebio Villanueva — Forest guard.

Forest Station at Kabibihan, Tayabas:
- Pedro C. Pujalte — Officer in charge.
- Cayetano Gamalinda — Forest guard.

Forest Station at Lucban, Tayabas:
- Norberto Soloria — Officer in charge.
- Angel S. Sarmiento — Forest guard.

DISTRICT No. 6.

[Provinces: Albay, Camarines Norte, Camarines Sur, and Sorsogon.]

Forest Station at Naga, Camarines Sur (district headquarters):
- Macario A. Mariano — Officer in charge.
- Gregorio J. Labitag — Ranger.
- Inocencio Ramirez — Ranger.
- Fermin Sol — Forest guard.
- Catalino Clemente — Clerk.

Forest Station at Paracale, Camarines Norte:
- Jesus O. Duran — Officer in charge.
- Eulogio Gines — Forest guard.
- Felix Andrade — Forest guard.
- Pedro Magistrado — Forest guard.

Forest Station at Sorsogon, Sorsogon:
- Numeriano Valencia — Officer in charge.
- Alejandro Eguarras — Forest guard.
- Melecio Lagunoy — Forest guard.

Forest Station at Catabañgan, Ragay, Camarines Sur:
Macario Simeon ..... Officer in charge.
Pedro Silvestre ..... Forest guard.
Vedasto Rafa ..... Forest guard.
Forest Station at Virac, Albay:
Felix Mabbayag ..... Officer in charge.
Mariano Tacorda ..... Forest guard.
Forest Station at Legaspi, Albay:
Filemon Kapuno ..... Officer in charge.
Vicente Encernereal ..... Forest guard.
Agapito Borja ..... Forest guard.

DISTRICT No. 7.

[Provinces: Antique, Capiz, Iloilo, Negros Occidental, and Romblon.]

Forest Station at Iloilo, Iloilo (district headquarters):
Jose B. Hirro ..... Officer in charge.
Jose B. Logan ..... Ranger.
Maximino Rondario ..... Ranger.
Pedro Valentin ..... Ranger.
Gabino Jarantilla ..... Forest guard.
Forest Station at Cadiz, Negros Occidental:
Bernardo Tocmo ..... Officer in charge.
Roman Amor ..... Ranger.
Ramon Javellana ..... Forest gurad.
Teodoro Oliveros ..... Forest guard.
Mansueto Olaira ..... Forest guard.
Fermin Quijano ..... Forest guard.
Leon de los Reyes ..... Forest guard.
Forest Station at Ilog, Negros Occidental:
Ramon Larracas ..... Officer in charge.
Vicente Villaflor ..... Ranger.
Inocencio Debuyan ..... Forest guard.
Pablo Panaguiton ..... Forest guard.
Magdaleno Pagonzaga ..... Forest guard.
Forest Station at Fabrica, Negros Occidental:
Juan S. Versoza ..... Officer in charge.
Gorgonio Canto ..... Forest guard.
Francisco Diaz ..... Forest guard.
Severino E. Lovero ..... Forest guard.
Ruperto Yzarri ..... Forest guard.
Forest Station at San Carlos, Negros Occidental:
Melecio Lopez ..... Officer in charge.
Fausto Ejercito ..... Forest guard.
Tiburcio Guanzon ..... Forest guard.
Forest Station at New Washington, Capiz:
Probo Villanueva ..... Officer in charge.
Hermenegildo Barabona ..... Forest guard.
Epifañio Biñas ..... Forest guard.
Flaviano Ocaban ..... Forest guard.

DISTRICT No. 8.

[Provinces: Zamboanga, Cotabato, Davao, Sulu, Misamis, Lanao, and Bukidnon.]

Forest Station at Zamboanga, Zamboanga (district headquarters):
James Logan ..... District forester.
Florencio Asiddao ..... Ranger.

Forest Station at Zamboanga, Zamboanga (district headquarters)—Cont.
Lonrenzo Logan ..... Ranger.
Pedro Aguilar ..... Forest guard.
Matias Arivan ..... Clerk.
Forest Station at Dipolog, Zamboanga:
Manuel Malana ..... Officer in charge.
Tomas Cuartero ..... Forest guard.
Antonio Dancalan ..... Forest guard.
Estanislao Buin ..... Forest guard.
Forest Station at Cotabato, Cotabato:
Nicanor E. Santos ..... Officer in charge.
Sixto Babao ..... Ranger.
Jose C. Nolasco ..... Forest guard.
Forest Station at Isabela Basilan:
Teodoro Tecson ..... Officer in charge.
Tajun (Moro) ..... Forest guard.
Isabela Ostrea ..... Forest guard.
Forest Station at Jolo, Sulu:
Juan Corales ..... Officer in charge.
Forest Station at Kolambugan, Lanao:
Severo Oliveros ..... Officer in charge.
Timoteo Quimpo ..... Ranger.
Pedro Carro ..... Forest guard.
Guillermo Luñgay ..... Forest guard.
Forest Station at Naga-Naga, Zamboanga:
Enrique Alviar ..... Officer in charge.
Santiago Babaran ..... Ranger.
Juan Daproza ..... Ranger.
Bonifacio Perez ..... Ranger.
Benito F. Antonio ..... Forest guard.
Bituanon (Moro) ..... Forest guard.
Manuel San Luis ..... Forest guard.
Forest Station at Port Banga, Zamboanga:
Jose Flores ..... Officer in charge.
Forest Station at Mati, Davao:
Juan C. Andrada ..... Officer in charge.
Forest Station at Davao, Davao:
Simplicio Aguilar ..... Officer in charge.
Gregorio Elumir ..... Ranger.
Ramon Mataya ..... Ranger.
Antonio Fernando ..... Forest guard.
Forest Station at Cagayan, Misamis:
Gregorio Miras ..... Officer in charge.

DISTRICT No. 9.

[Province: Palawan.]

Forest Station at Puerto Princesa, Palawan (district headquarters):
Ptolomeo Causing ..... Officer in charge.
Miguel Pato ..... Ranger.
Benito L. Roque ..... Ranger.
Forest Station at Coron, Palawan:
Mauro Ablaza ..... Officer in charge.
Alejandro Palao ..... Forest guard.

DISTRICT No. 10.

[Provinces: Leyte, Surigao, Samar, and Masbate.]

Forest Station at Tacloban, Leyte (district headquarters):
- Adriano V. Santos — Officer in charge.
- Agustin P. Angeles — Ranger.
- Jose G. Pacis — Ranger.
- Leon Rojas — Ranger.
- Florentino C. Versoza — Ranger.
- Marcelo Mercado — Forest guard.
- Florentino L. Nerviol — Forest guard.
- Margarito Rosales — Forest guard.
- Jose Sydiongco — Forest guard.
- Pablo de la Cruz — Clerk.

Forest Station at Catbalogan, Samar:
- Ramon Acuña — Officer in charge.
- Potenciano Lucero — Forest guard.

Forest Station at Laoang, Samar:
- Emeterio Edmilao — Officer in charge.
- Sergio Giray — Forest guard.

Forest Station at Masbate, Masbate:
- Atanasio B. Catambay — Officer in charge.
- Lino Bajar — Forest guard.
- Felix Perez — Forest guard.

Forest Station at Surigao, Surigao:
- Perfecto Tomeldan — Officer in charge.

DISTRICT No. 11.

[Provinces: Bataan, Rizal, Cavite, Pampanga, Bulacan, and Southern Zambales.]

Forest Station at Manila (district headquarters):
- Clemente Mariano — Officer in charge.
- Ambrosio Galisim — Ranger.
- Pio Ilusorio — Forest guard.
- Eugenio Mendoza — Clerk.

Forest Station at Arayat, Pampanga:
- Hilario Borromeo — Officer in charge.
- Hospicio Guevarra — Forest guard.

Forest Station at Orani, Bataan:
- Pedro Gangan — Officer in charge.
- Victorio Alquiroz — Forest guard.
- Arcadio Nava — Forest guard.

Forest Station at Limay, Bataan:
- Tomas N. Roque — Officer in charge.
- Florencio M. Songco — Ranger.
- Deogracias Agustin — Forest guard.
- Primitivo Baluyot — Forest guard.
- Valentin Hizon — Forest guard.
- Dionicio Mananghaya — Forest guard.
- Teodoro Magalindan — Forest guard.

Forest Station at Moron, Bataan:
- Fernando L. Amarillas — Officer in charge.
- Raymundo Santos — Forest guard.

Forest Station at Norzagaray, Bulacan:
- Andres Bernardo — Officer in charge.
- Marcelino Catapusan — Forest guard.

Forest Station at Masinloc, Zambales:
Valentin Sajor..... Officer in charge.
Valeriano V. Elgincolin..... Forest guard.

DISTRICT No. 12.

[Province: Mindoro.]

Forest Station at Calapan, Mindoro (district headquarters):
Cornelio Nable Jose..... Officer in charge.
Eusebio Leuterio..... Ranger.
Aniano David..... Ranger.
Cornelio Acedillo..... Forest guard.
Forest Station at San Jose, Mindoro:
Manuel Tupas..... Officer in charge.
Leoncio Rebong..... Ranger.
Fulgencio E. Pandiño..... Forest guard.

DISTRICT No. 13.

[Provinces: Cebu, Negros Oriental, and Agusan.]

Forest Station at Cebu (district headquarters):
Isabelo Achacoso..... Officer in charge.
Leonor Lizardo..... Ranger.
Silvino Reyes..... Ranger.
Vicente Zosa..... Ranger.
Victoriano Caratao..... Forest guard.
Rufino A. del Mar..... Forest guard.
Juan Dosado..... Clerk.
Forest Station at Dumaguete, Negros Oriental:
Alberto Villanueva..... Officer in charge.
Venancio S. Fernandez..... Forest guard.
Forest Station at Butuan, Agusan:
Angel Mallonga..... Officer in charge.
Rufo Burnea..... Forest guard.
Norbreto D. Conde..... Forest guard.

DIVISION OF FOREST LANDS AND MAPS.

Rafael Medina..... Forester, Chief.
Doroteo Soriano..... Forest Supervisor, Assistant to the chief.
Marcelino Quimpo..... Clerk.

FOREST LANDS SECTION.

Cecilio Maneja..... Forest Supervisor, Chief.
Fausto Alambra..... Ranger.
Eugenio de la Cruz..... Ranger.
Alejandro de Mesa..... Ranger.
Crispino Tansioco..... Ranger.
Eligio Cordero..... Clerk.
Conrado Tongco..... Clerk.

RECONNAISSANCE SECTION.

Severo S. Ponce..... Forest Supervisor, Chief.
Pedro Aduviso..... Ranger.
Vicente Castillo..... Ranger.
Aquilino Contreras..... Ranger.

Leoncio A. de la Cruz	Ranger.
Vicente Caguioa	Ranger.
Juan Fontanoza	Ranger.
Quintin Gellidon	Ranger.
Pedro Montero	Ranger.
Celso Medrano	Ranger.
Juan Oblina	Ranger.
Vicente Parras	Ranger.
Gervasio Rarang	Ranger.
Angel Salazar	Ranger.
Rafael San Pedro	Ranger.
Edilberto Barot	Clerk.
Bernardino A. Valderrama	Clerk.

MAP SECTION.

Cornelio Samaniego	Draftsman, Chief.
Cayetano Crisostomo	Draftsman.
Cecilio de la Cruz	Draftsman.
Marcelino Cruz	Draftsman.
Sebastian Domingo	Draftsman.
Moises de Guzman	Draftsman.
Wenceslao Moje	Draftsman.
Angel Reyes	Draftsman.
Hermogenes Reyes	Draftsman.
Gregorio Vicencio	Draftsman.

DIVISION OF INVESTIGATION, LOS BAÑOS, LAGUNA.

William H. Brown	Technical employee, Chief.
Theodore C. Zschokke	Forester.
Antonio P. Racelis	Forester.
Otto W. Pflueger	Forester.
Frank Cofren	Proof reader
Jose F. Nano	Ranger.
Maximo Oro	Ranger.
Francisco L. Rola	Ranger.
Carlos Sulit	Ranger.
Felipe Salvoza	Ranger.
Felix Columbres	Forest guard.
Esteban Mojado	Forest guard.
Nicolas Angeles	Nurseryman.
Florentino Canicosa	Nurseryman.
Domingo Ilag	Nurseryman.
Maximo Pañga	Nurseryman.
Julian Rebelleza	Nurseryman.

DIVISION OF SAWMILLS AND UTILIZATION.[1]

William Crosby	Forester, Chief.
Donato P. Miranda	Forest supervisor.
Sinforoso Apacible	Forest guard.
Pablo Roque	Forest guard.
Doroteo Abella	Clerk.

[1] All scalers under Division of Forest Management are also under this division.

ADMINISTRATIVE DIVISION.

Vicente C. Ramos ..... Chief clerk.
Eugenio Tadle ..... Cashier and Disbursing officer.
Jovito Unite ..... Senior stenographer.
Aurea Villaruz (Miss) ..... Junior stenographer.
Agustin Cardines ..... Clerk.
Mauro Linchanco ..... Messenger.
Gabino Cubos ..... Chauffeur.
Ignacio Cebrano ..... Janitor.
Pastor Ramos ..... Janitor.
Macario Rivera ..... Janitor.

RECORDS SECTION.

Aquilino C. Bartolome ..... Chief.
Jacinto Barlis ..... Clerk.
Juanita Canlas (Miss) ..... Clerk.
Jose Caluag ..... Clerk.
Laureano Navasca ..... Clerk.
Carlos Ubuñgen ..... Clerk.
Jose Salvador ..... Clerk.
Francisco Balderosa ..... Messenger.
Balbino B. Nanong ..... Messenger.

DIVISION OF ACCOUNTS AND PROPERTY.

Cirilo Asperilla ..... Chief.
Sulpicio Olimpo ..... Clerk.

AUDITS SECTION.

Melchor Enriquez ..... Clerk.
Juan Acojido ..... Clerk.
Deogracias Antonio ..... Clerk.
Aguedo Castro ..... Clerk.
Demetrio Saluñga ..... Clerk.
Jose Santos ..... Clerk.
Francisco O. Santos ..... Clerk.

PROPERTY SECTION.

Pablo D. Villena ..... Chief.
Venancio Babida ..... Clerk.
Vicente Gatan ..... Clerk.
Santiago Laya ..... Clerk.
Victorino Narcelles ..... Clerk.
Irineo Carlos ..... Janitor.
Bartolome Estacio ..... Janitor.
Severino Esguerra ..... Watchman.
Epitacio Oblepias ..... Watchman.

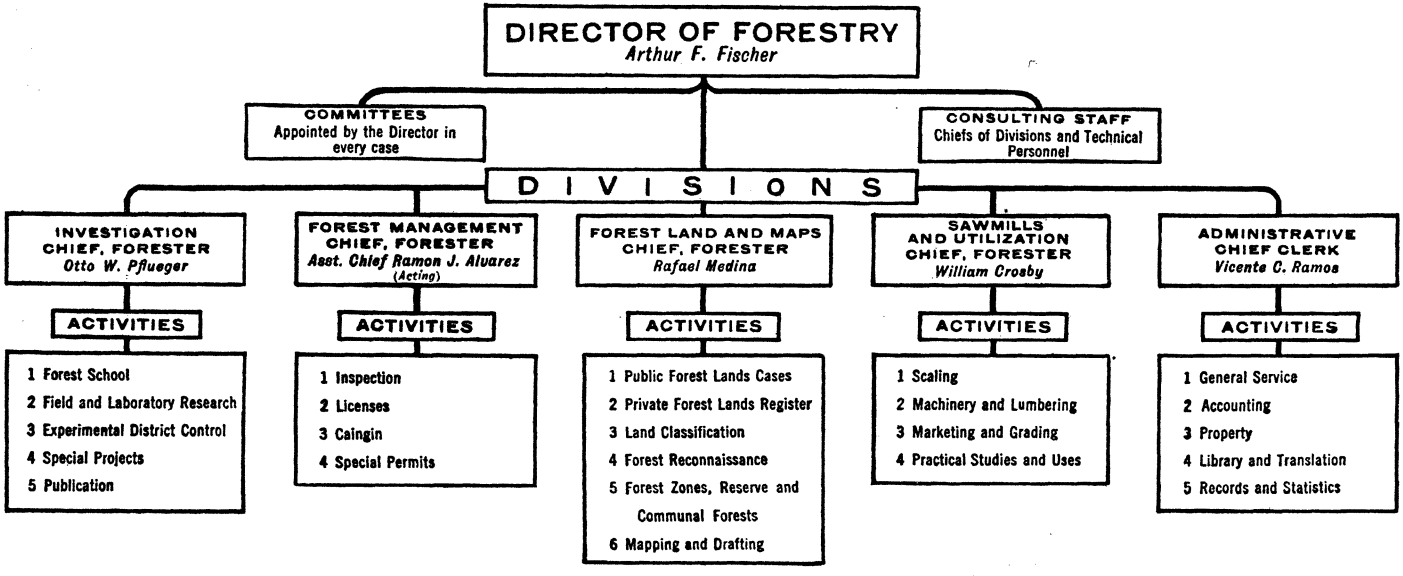
LIBRARY AND STATISTICAL SECTION.

Simplicio Beltran ..... Chief.

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ORGANIZATION DIAGRAM–BUREAU OF FORESTRY

1921



Philippine Islands Bureau of Forestry

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1921

ARTHUR F. FISCHER
Director of Forestry

MANILA
BUREAU OF PRINTING
1922

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY

MANILA, *February 2, 1922.*

SIR: I have the honor to submit the Annual Report of the Bureau of Forestry for the fiscal year ending December 31, 1921. The undersigned returned from leave in the United States on March 4, 1921, after an absence of nearly a year. He wishes to take this occasion of acknowledging the loyalty and effort put forth by the entire personnel of the Bureau of Forestry under trying conditions during his absence.

LEGISLATION

During the year no bills were passed affecting the Bureau of Forestry, but one bill was introduced—House Bill No. 962, providing that ten per cent of the forest charges be given the municipality from which the forest products were taken. This bill failed of passage.

A considerable number of changes in the laws affecting the Bureau of Forestry were proposed through the Office of the Secretary of Agriculture and Natural Resources and later on these changes were submitted to the Finance Commission at their request, in order for them to study the proposed changes in relation to their plan of reorganization.

PERSONNEL

The acute condition in regard to personnel has again prevailed this past year, but due to the financial depression and consequent business depression, many of the licensees either curtailed their business or closed up entirely, which eased the situation to some extent during this year. This allowed us to carry on, at least in part, the work of land classification which had not been carried out as per schedule and needs of the Government. Another fact augmenting the personnel question considerably was the revision allowed by the Governor-General and the Civil Service during 1920, by placing rangers in a special classification and raising the maximum salary to ₱2,400, but the appropriation allowed by the Government did not permit the carrying out of this change. During 1920, con-

siderable resignations took place because of dissatisfaction on this account, but the general business conditions developed a disposition on the part of some of these men for reinstatement into their former positions. This could not be allowed because of the action of the Emergency Board in cutting down appropriations to such a point that the Bureau was unable to fill these positions and even if these positions were available, the necessary allotment for travel, equipment, etc., was not available. This brought about a tremendous increase of work to be carried by the remaining personnel of this Bureau and necessitated the refusal of requests for leave. This again did not aid to the morale.

Should indications of the revival of the lumber industry materialize, the amount of work to be carried by the personnel of this Bureau during the coming year, without adequate recognition on the part of the Government in the increase of salaries, already allowed by the Civil Service and the Governor-General's Office, in the ranger classification, there is no doubt that instead of alleviating the personnel situation of this Bureau, it will be augmented. During the past year, 21 resignations took place. They are classed as follows: Two foresters, one wood expert (retired), seven rangers, ten clerks, and one draftsman.

After reduction of personnel due to resignation or economy, the classified force on December 31, 1921, consisted of: One Director, 9 foresters, 1 assistant forester (in the United States as pensionado), 11 forest supervisors (9 in active service, 2 in the United States as pensionados), 134 rangers, 6 draftsmen, 42 clerks, and 2 messengers, making a total of 206. The temporary employees were: Two technical employees (1 without compensation), 1 proof-reader, 2 laboratory helpers, 66 forest guards, 10 clerks, 5 draftsmen, 5 nurserymen, 6 carpenters, 2 varnishers, 1 chauffeur, 1 messenger, 2 watchmen, 5 janitors, 3 laborers, and 1 porter, making a total of 112. The entire force on December 31, 1921, was therefore 318.

DIVISION OF FOREST MANAGEMENT

The main work of this Division consists in formulating and carrying out under the direction of the Director, rules and plans for the proper protection and exploitation of the forest, having in view the improvement of the composition and density of the stand and to carry out the work so that in the future we may always have a supply of valuable forest products for the market.

The force of this Division at the end of the year consists of the following field and office force: Four foresters, one assistant forester, six forest supervisors, eighty-three rangers, forty-four forest guards, one junior stenographer, and fourteen clerks.

The present force of this Division is not sufficient to handle the full volume of pending work although the amount of work accomplished in proportion to the number of personnel is very gratifying.

To secure a proper supervision of license areas, caiñgin patrol, special use permits and illegal cutting operations, an increase in the present force of at least 20 per cent is necessary.

INSPECTION

The following table shows the forest stations throughout the thirteen districts inspected during the year 1921 by the supervising personnel of the Bureau:

District No.	Station.	Inspected by—	Date, 1921.	Report submitted.
1	Echague	A. Suyat	September 6	1
	Ilagan	do	July 10–19	
	Alcala	do	May 11	
	Aparri	do	April 6	
	Claveria	do	April 10–25	
4	Dagupan	do	October 27	
	Bayombong	A. L. Cenabre	July 11	Sawmill.
5	K abibihan	do	November 15	One sawmill.
	Calauag	Director	December 23	
6	Catabangan	A. L. Cenabre	November 29	1
	Naga	do	November 3	1
	Legaspi	do	September 27	1
	Sorsogon	do	October 19	1
	Virac	do	October 3–5	1
	Mercedes	do	September 6	1
8	Zamboanga	J. Lopez	April	1
	Cotabato	do	April	
	Jolo	do	April	
	Cagayan	do	April	
13	Davao	P. S. Buenaventura		
	Cebu	J. Lopez	April	
	Butuan	do	April	1

As can be seen from the foregoing table, there was less inspections made this year than in 1920. The district foresters and officers in charge of the districts, however, practically inspected all the forest stations under their respective jurisdiction.

LICENSES

License Statistics.—During the year 1921, there was a decrease of 184 in the number of ordinary timber licenses issued as compared with 1920, a total of 2,309 being issued during the year. This decrease was due principally to the decreasing demand for lumber resulting from the acute commercial depression prevailing throughout the world, and partly to the policy of this office to curtail as much as possible the tendency

of many persons to control timbered areas for speculative purposes without any intention of personally operating them and investing capital in the operations, and to the requirement imposed by this Bureau to every applicant to deposit cash bonds in accordance with Department Order No. 10 of the Honorable, the Secretary of Agriculture and Natural Resources, series 1920.

On the other hand, a little improvement was noted in the minor forest product business. This is shown by the fact that of licenses for such products, a total of 4,635 were issued, showing an increase of 724 over those of the previous year. This increase was attributed primarily to the increasing demand for tanbark, dyebark, wood oils, diliman, gogo, and guano, and partly to the reaction on rattan industry.

In regard to gratuitous licenses there was a slight increase, 2,692 being issued in 1920, whereas this year there were 2,799, an increase of 107. In addition to these there were 378 licenses issued this year for building tobacco curing houses.

Tables showing in detail the licenses issued and the amount of forest products utilized during the year, and a comparison of the totals of each with those of the previous year, will be found in the appendix.

OFFENSES OF LICENSEES

There was a marked decrease in the offenses of licensees in 1921, due to the more careful inspection of license areas, the increased efficiency in patrol work by forest guards, and careful operations of licensees to observe the rules and regulations of this Bureau.

The most noticeable violations which came to the attention of this Office is the cutting of undersize first group trees for ties and those by licensees who merely secure a license and then collect a royalty from people who want to cut timber and firewood and other forest products. The licenses of such persistent offenders are promptly cancelled.

OFFENSES OF NON-LICENSEES

There has been a marked decrease during 1921, in the number of complaints received of illegal cutting by non-licensees. It is attributed to the increased efficiency of the patrol work and inspection of barrios and sitios by the forest guards.

COÖPERATION AND PROPAGANDA

The wide spread of propaganda of forest conservation and forest protection resulting from wise management of the forest

begun by the Bureau in the past years has not been successful in 1921. The district men under this Division gave informal talks in barrios and in public schools when opportunities presented themselves and explained conservation, forest protection, and the evil of forest destruction by caiñgin and cogon fires to the people; but due to the general depression, and low price of agricultural products, a big number of people was compelled to produce food crops by making caiñgins as a temporary relief.

RESIN LICENSES

Past experience has shown the necessity of stricter control of the limited almaciga stand in the Islands. As fast as data are received, therefore, license agreements will be issued in the operation of all almaciga licenses as well as on other oil, resin or gum products if circumstances and other conditions permit. The present system of extracting the almaciga and balao resins is indeed very destructive that experiments will be made on the new cutting rule for the collection and extraction of almaciga.

STATISTICS

Statistics of licenses issued by provinces, forest products cut, forest charges collected, amount of fines, including the checking of auxiliary invoices, as well as the amount of rental for the use of forest land is being compiled by the Division and the increase of licenses as well as permits for the use of forest land in all its phase will require a considerable number of additional clerks.

SPECIAL PERMITS SECTION

The different uses of forest lands under Section 1838 of the Administrative Code have become gradually better known throughout the Islands and as a natural result, the work in this section had been greatly increased. At the close of the year there were on record 709 applications for leases and permits besides 32 minor forest product applications for exclusive license agreements.

Experience has shown that the leasing of forest lands for fishponds, saltworks or other purposes has also been used for speculative ventures by some applicants as in the case of ordinary forest licenses. At the outset an urgent step was necessary to check the practice and it was therefore imperative that radical changes be made in the established policy and procedure. For this reason the depositing of cash instead of personal bonds as a guaranty for the satisfactory compliance with

the terms of the lease or permit has been required of all applicants before and not after the agreements for leases were prepared. The policy had a salutary effect as it was found that out of the 293 applicants who were requested to deposit bonds only 16 had been able or were willing enough to do so.

In the case of fishponds and saltworks, a bond of ₱20 per hectare was deemed sufficient although a conservative cost estimate for replanting one hectare of mangrove swamp would require approximately from ₱30 to ₱60. In pasture or residence permits, the payment of the annual rental in advance is the only necessary requisite, it being understood that the same will be forfeited in case of non-use of the permit granted.

SPECIAL USES

There has been issued during the year 11 lease agreements, 16 ordinary fishpond and saltworks permits, 54 pasture permits and 3 special uses as compared with 12 lease agreements, 13 pasture permits and 1 minor product license agreement granted in the year just past. Two lease agreements were cancelled during the year, thus making the total number in force as 21 lease agreements. Nine pasture permits granted in 1920 were extended to expire on December 31, 1921.

The following table will show the status of the applications on hand at the close of business for the year 1921.

Status of special permit applications on December 31, 1921

Class of applications.	Disapproved or cancelled.	Pending.			Number of—				Total number of applications, December 31.
		Inspection.	Bond.	Issue of lease or permits.	Lease issued 1921.	Permits issued 1921.	Lease in force.	Lease cancelled.	
Fishpond	136	26	273	8	6	14	6	2	471
Saltworks	10	6	12	2	5	2	5	.....	42
Pasture	28	45	.....	54	.....	54	.....	.....	181
Residence	1	.....	.....	6	.....	.....	.....	.....	7
Special use	.....	.....	.....	1	.....	2	.....	.....	3
Sawmill site	.....	.....	2	2	.....	.....	1	.....	5
Hotel or sanatoria	.....	.....	1	.....	.....	.....	.....	.....	1
Nipa plantation	1	.....	.....	23	.....	.....	.....	.....	24
Bacauan plantation	.....	1	.....	3	.....	.....	4	.....	8
Total	176	78	288	99	11	72	16	2	742

It will be noted in the foregoing table that ordinary saltworks and fishpond permits were granted, this being necessary in order to authorize the applicants to begin construction work as well as to legalize the collection of annual rental before the agreements for long term leases were prepared in proper form. No action were taken on application for special uses unless the area desired had been inspected and surveyed and that all pos-

sible doubts of ownership had been removed. Claimants are, in all cases, invariably given reasonable allowance to show proofs of ownership if not preference over all others to lease the area. This requirement, alone, among others, tends to delay the action on applications for special uses and that at best it takes about from six months to one year before the permit or lease is finally issued to an applicant.

In spite of the increased bulk of work in the section, however, the personnel had not been increased. The forest supervisor in charge had devoted his time to the checking of all reports and permits or leases issued while his assistant, a senior ranger, had been detailed on subjects pertaining to the Division of Investigation. During the last semester some changes in forms and procedure were adopted which resulted in a more efficient handling of the work than heretofore. The assignment of an additional ranger and another clerk is imperative, in order to cope with the increasing bulk of work.

PASTURES

The cattle industry in the Philippines is constantly growing and will become one of the most important industries.

Permits are now being granted for grazing on public forest lands and data collected to show the effects of grazing and proper control measures necessary to apply to this class of permits.

In the Non-Christian provinces, the issuing of permits has been in the hands of the Bureau of Lands under Act No. 2176, but the Attorney-General has been requested to give his opinion as to whether Act No. 2176 and Section 1838 of the Administrative Code do not conflict and as to which Bureau should have the control of this work in the Non-Christian provinces.

The control of this work in these provinces will, therefore, be based on the opinion rendered by the Attorney-General.

RESIDENCE

A tentative plan has been prepared by which squatters on forest lands will be put under proper control. It has been the practice of many *caiñgineros* to reside on or in the vicinity of their clearings and in many cases they declare the area as their private property, paying land taxes therefor. At other times they do not care to pay for their bit to the municipality but simply move from place to place without any permanent settlement. In order to check abuses, the Bureau proposes to issue in subsequent years ordinary residence permits to people

found residing within the forest and for the use of which very moderate rentals will be charged.

Aiming primarily as a means to enable us to control squatters, the system may in itself become a possible source of revenue from land that would otherwise remain idle. It will, however, follow that the bulk of the work will correspondingly increase and that the necessary personnel will be required.

CAIÑGINS

The general business depression which occurred during the year has compelled a big number of people to produce food crops by the caiñgin system as a temporary relief measure. As a natural result there were issued by the local forest officers 2,592 caiñgin permits during the year. More cases of caiñgin violations are on record this year, there being reported 1,602 illegal caiñgin cases as against 721 in 1920. Six hundred seventy-three of the cases brought to court resulted in conviction as against 184 of last year. These results were obtained due to the continued coöperation of the Provincial Fiscals and Justices of the Peace as well as the increased efficiency of the field men in handling caiñgin cases.

It will be noted in the data given below that there were cleared during the year in violation of the caiñgin law some 1,500 hectares of forest land. The Government charges including surcharges on forest products burned, destroyed, or otherwise injured amounts to ₱178,943.91. The yearly destruction of valuable timber as well as the opening of virgin forest lands requires serious consideration on the part of the Government.

A radical change in the procedure in dealing with caiñgin violations has been inaugurated during the latter part of the year. This is by taking action on caiñgin cases either administratively through the Bureau of Internal Revenue or taking the matter up criminally before the courts. It is hoped that with this procedure many caiñgin cases will be promptly settled instead of having them held pending before the courts for months or sometimes for years.

The following tables show the number of caiñgin permits granted and the status of caiñgin cases reported from each province during the year:

List of caiñgins reported during the period from January 1 to December 31, 1921

Province.	Caiñgin agreement.	Collective caiñgin permits.	Caiñgin permits granted.	Caiñgin application disapproved.	Total.
Abra			246		246
Agusan			18		18
Albay				1	1
Antique			1		1
Bataan					
Batanes					
Batangas	1		1		2
Bohol					
Bukidnon					
Bulacan					
Cagayan			43		43
Camarines Norte			5		5
Camarines Sur			4		4
Capiz					
Cavite					
Cebu			4	3	7
Cotabato			5		5
Davao		8	347	7	362
Ilocos Norte			1		1
Ilocos Sur			24		24
Iloilo					
Isabela			22		22
Laguna			14	8	22
Lanao			14		14
La Union	102		192	1	295
Leyte			116	22	138
Marinduque			1		1
Masbate			32		32
Mindoro			67		67
Misamis			24		24
Mountain Province			447	2	449
Nueva Ecija			2	1	3
Nueva Vizcaya			17		17
Occidental Negros			11	3	14
Oriental Negros			4	2	6
Palawan			310		310
Pampanga			1		1
Pangasinan			2		2
Rizal			154	5	159
Romblon			2		2
Samar			177	16	193
Sorsogon				1	1
Sulu					
Surigao			19		19
Tarlac			1		1
Tayabas			164	3	167
Zambales	1		12	10	23
Zamboanga			88	12	100
Total	104	8	2,592	97	2,801

Illegal caiñgins reported during the fiscal year from January 1 to December 31, 1921

By provinces.	Cases reported by forest officer.	Total area in hectares.	Total charges and surcharges.	Acted upon—				
				Convicted.	Acquitted.	Warned.	Invoices sent to municipal treasurer.	Total.
Abra	5	2.00	90.30				5	5
Agusan	9	6.28	872.80			3	5	8
Albay	67	51.00	4,035.72				36	36
Antique	12	10.95	437.76				5	5
Bataan								
Batanes								
Batangas								
Bohol	36	43.34	4,731.18	36				36
Bukidnon								
Bulacan	3	3.50	155.12	3				3
Cagayan	3	3.80	430.58	1	1			2
Camarines Norte	24	11.04	2,205.78	6				6
Camarines Sur	28	25.58	2,104.48	8			6	14
Capiz	1	1.50	233.96					
Cavite								
Cebu	24	19.75	1,950.57	13	8			21
Cotabato								
Davao	8	16.50	1,684.89			2	3	5
Ilocos Norte	9					9		9
Ilocos Sur	24	14.00	181.20	16	4		5	25
Iloilo								
Isabela								
Laguna	13	12.00	1,392.08	9				9
La Union								
Leyte	164	108.90	9,381.56	87			6	93
Manila								
Masbate	342	195.58	17,568.20	148			34	182
Marinduque	1	1.00	30.30				1	1
Mindoro	21	15.25	1,650.94	4	2			6
Misamis	19	14.00	2,768.66	13				13
Mountain Province	31					31		31
Nueva Ecija	4	8.50	665.78					
Nueva Vizcaya								
Occidental Negros	39	22.26	3,540.36	25			7	32
Oriental Negros	6	3.03	265.20	6				6
Palawan	4	2.50	811.22	1				1
Pampanga								
Pangasinan	12	5.22	302.34					
Rizal	34	25.50	800.40	26				26
Romblon	25	18.11	3,207.50	12	2			14
Samar	251	173.14	6,876.40	146	41			187
Sorsogon	90	52.50	9,299.56	37	11			48
Surigao	16	7.95	1,618.24	1				1
Tayabas	49	36.06	3,767.74	21			3	24
Zambales	95	64.64	6,962.79	54	1		27	82
Zamboanga	27	30.10	2,392.64			12	14	26
Total	1,496	1,005.48	92,416.15	673	70	57	157	957
Misamis[1]	106	424.00	86,527.76					
Grand total	1,602	1,429.48	178,943.91	673	70	57	157	957

[1] All the auxiliary invoices on the 106 cases recently reported from Misamis are not as yet received at the Manila Office and only an approximate estimate was made from some of the reports now on hand.

PROPOSED SUPPRESSION OF ILLEGAL CAIÑGINS

1. The Division had always made it a point to attend to the forest destruction with the utmost vigilance. In line with detecting of frauds and illegal cutting of licensees and non-licensees, forest guards are employed for patrol purposes and all forest officers made it a point to investigate and take final action on all illegal caiñgin cases. The increase of the guards

for patrol work will, therefore, be a part of our aim in the course of the next five years.

2. The new procedure of dealing with illegal caiñgins will facilitate prompt settlement of any cases which would otherwise be pending for months. As rapidly as circumstances permit forest guards will be authorized to file criminal complaints before justices of the peace against violators whose caiñgins are detected in the course of their trips.

3. The suppression of the caiñgin evil depends to a great degree on the coöperation of the municipal officials and licensees and all forest officers will as heretofore endeavor to obtain that coöperation among all the people concerned. Licensees and holders of caiñgin permits are required to report to the nearest forest officer all violations which may come to their knowledge.

4. *Legislation.*—In order to suppress the caiñgin evil and to have the municipal authorities on our side, it is advisable that out of the fines collected on caiñgin cases by our courts or by the Bureau of Internal Revenue, as the case may be, should be given to the municipality where the caiñgin was made and the money should go into the municipal funds. Hence it would be necessary to draft a law to this effect.

FOREST DISTRICTS AND STATIONS

The northwestern part of Mindanao or the territory covered by the forest stations of Cagayan de Misamis, Kolambugan, and Dipolog (formerly District No. 8), was transferred to District No. 13 as it was found easier for the officer in charge of Cebu to visit this region than the district forester of Zamboanga.

All the territories covered by the municipality of Bangui, Ilocos Norte, have been segregated from the Vigan Forest Station (District No. 2) and added to the forest station at Claveria (District No. 1).

During 1921, the following stations were opened:

1. San Quintin, Pangasinan Province ..... District No. 4.
2. Mauban, Tayabas Province..... District No. 5.
3. Mercedes (Daet), Camarines Norte Province District No. 6.
4. Dipolog, Zamboanga Province ..... District No. 8.
5. Balabac, Palawan Province ..... District No. 9.

The forest stations at Paracale of District No. 6, Lucban of District No. 5, Cuyapo of District No. 4, and Dapitan of District No. 8 were closed. The forest station at Cotabato was burned on August 10 by the fire that also burned the provincial govern-

ment building. All the records, supplies, and equipments of the forest station were also reduced to ashes.

SUMMARY OF REPORTS FROM FOREST DISTRICTS

The following are extracts from the annual reports of the officers in charge of districts. The majority of these reports contain considerable information which is omitted for lack of space.

District No. 1: Headquarters, Aparri, Cagayan.—Provinces: Cagayan, Isabela, and northern portion of Ilocos Norte. Area: 10,155.6 square miles.

The lumbering business in the district had been practically paralyzed although a few of the big licensees had steadily carried on their operations. The reduction of lumber prices by almost 40 to 50 per cent has also increased the inactivity of licensees.

There is, however, a notable increase of licenses issued for tobacco curing-houses by 100 per cent over the last year's figure. The failure of the tobacco crops during the year has compelled laborers to work in the forest and the owners took advantage of the cheap labor then available.

The collection of rattan has been stopped in view of the failure of the tobacco business during the year.

A notable increase of violation is reported, a total of ₱12,587.31 in forest charges being of record as against ₱6,657.91 of last year.

A land classification party of 13 rangers from the Manila Office, aided by the district force, classified the Provinces of Cagayan and Isabela into "alienable and disposable" and timber lands in accordance with Act No. 2874. It is hoped that the settlement of public lands among other things, will result from this classification.

District No. 2: Headquarters, Vigan, Ilocos Sur.—Provinces: Ilocos Norte (except Bangui and Langangan), Ilocos Sur, and Abra. Area: 3,588.8 square miles.

In spite of the monetary crisis felt all over the Islands the licensees in this district operated continuously throughout the year and filled all local lumber demands. There is an increase of 24 ordinary timber and 43 minor product licenses over the number granted last year.

Silvicultural conditions have been very good, there being abundant reproduction of the important timber species from seedlings and sprouts. Sufficient seed trees are left all over the cutting areas and no signs of burning were noted.

Only cogon fires occurred but they did not in any way affect the existing stand, the areas adjacent to the forest being encroached by Parang and other second growth species. Only 27 caiñgin violations were detected, and 11 proposed communal forests were inspected during the year, the reports of which are still pending at the district office.

As a result of the demonstration plots exhibited and maintained during the last three years, there is a strong wish of the residents of the municipalities to have their communal forests replanted with valuable tree seedlings. The seedlings can be raised at the forest nurseries at barrio Baniao, Bantay, and barrio Agayao, Santa Cruz, Ilocos Sur.

District No. 3: Headquarters, Baguio, Mountain Province.—Subprovinces: Amburayan, Benguet, Bontoc, and Lepanto; and La Union (northern part). Area: 3,419.6 square miles.

While the construction of public and private buildings in Baguio had been curtailed in view of the financial crisis and the retrenchment policy of the Government, there was nevertheless an increase of some 1,500 cubic meters of timber invoiced by the two sawmills over the figures given last year. The records of the Benguet Consolidated Mining Company show a slump in their timber operations, having cut only 829 cubic meters or about 2,000 cubic meters less than last year's cut. In order to facilitate the transportation of timber and posts a 12,000 feet areal cable is just being started from the mines to their cutting area at Mt. Apalan.

There is also a notable increase in the exploitation of minor forest products, there being cut 2,000 cubic meters of firewood over the amount reported last year. Charcoal, fern tree and Christmas tree licenses were also issued, the latter being properly assessed by the Collector of Internal Revenue during the latter part of the year.

Although it was formerly decided to suspend the establishment of communal forest in the district, five communal forests have been inspected and one was resurveyed.

In addition to the Benguet Consolidated Mining Company, the Headwater Mines which had been operated more or less desultorily during the past years had also shared in the limited mine timber supply of the district. No other mining concern had resumed any active operation during the year.

The number of caiñgin permits issued during the year shows an increase of 173 over the number granted in 1920. Twenty-seven illegal caiñgins were detected but the authors of which

were warned, it being their first offense. The intensive patrol work carried on by guards is giving satisfactory results in the decrease of forest violations within the confines of the Baguio forests.

The fire season this year has not been as severe as in past years. There were reported 47 fires, the biggest of which is 11 hectares in extent, the rest being from one-fourth of a hectare to 4 hectares. The total number of seedlings destroyed and poles killed or injured has come close to 15,000. The fire protection system has been revised so as to enable the firewarden to go to the scene of the fire with the least possible delay. A motorcycle has been provided for the purpose and the indications are that satisfactory results were obtained.

District No. 4: Headquarters, Dagupan, Pangasinan.—Provinces: Nueva Ecija, Nueva Vizcaya, Pangasinan, Tarlac, and La Union (southern part). Area: 8,718 square miles.

The timber market in the district has been greatly depressed by abnormal conditions that prices, as well as wood operations, had been considerably decreased. The proposed purchase of modern machinery from the States by one licensee has been postponed indefinitely. The four sawmills in the district had been run intermittently during the year. On the other hand, minor products such as firewood, camanchili bark, buri, rattan, etc., commanded better prices than those of last year.

The policy of prohibiting the exportation of timber cut within Pangasinan was raised this year, in view of the fact that illicit exportation has been rampant and it was not possible, with the limited personnel, to check the practice.

Auxiliary invoices covering ₱2,479 from licensees and ₱5,383 from non-licensees in the form of forest charges were sent out for collection during the year for forest violations. Thirty-nine illegal caiñgins were detected, six of which were already brought to court resulting into conviction. Of the thirty-three cases, the authors voluntarily offered to pay the forest charges of timber destroyed and to plant Ipil-ipil seeds on the area before abandoning the same.

The examination of areas applied for fishponds and pastures formed an important work in the district. There are of record 63 fishpond and 26 pasture applications received, most of which are as yet pending due to shortage of men.

The prevalent unsatisfactory silvicultural condition of the forest throughout the district remains unchanged. This is

applied equally to the timber land as well as to mangrove swamps. Unless a reasonable increase in the personnel is given, nothing can be done to remedy the situation.

Reforestation experiment with planting of Ipil-ipil has been begun in Mangatarem, Pangasinan. Some 38 liters of Ipil-ipil seeds have been broadcasted during August of this year on four hectares of Government land.

The following interesting resorts and mineral springs were reported to offer unusual opportunities for recreation or exploitation:

1. Sual Bay.
2. Rocking Stone at Balincaguin, Pangasinan.
3. Warm Sulphur Spring of Mangatarem, Pangasinan.
4. Sulphur Spring of Santo Tomas, La Union.
5. Warm Salt Spring of Pugo, La Union.
6. Salt Spring of Salinas, Nueva Vizcaya. (Salinas Forest Reserve).

District No. 5: Headquarters, Los Baños, Laguna.—Provinces: Batangas, Laguna, Marinduque, and Tayabas. Area: 6,184.9 square miles.

No very great change has been noted in the lumbering activities in the district in contrast with that of last year. The number of licenses issued had been decreased in view of the fact that bonds are now required. There has been, however, a notable increase in the number of minor forest product licenses issued especially firewood, rattan, pili resin, etc.

Some 84 licensees committed violations of a minor character involving forest charges in the sum of ₱1,837.35. Three hundred and sixty-one violations of non-licensees were reported, the charges including surcharges being ₱9,087.63. Eighty-one illegal caiñgins were also reported in which forest products were destroyed, the forest charges on which amounts to ₱7,635.75.

A small sawmill has been established in Santa Cruz, Laguna, during the year. The sawmills in Calauag and Kabibihan had been operating steadily, in spite of business depression everywhere.

The land classification of a portion of the Province of Tayabas was carried on by members of the Division of Forest Lands and Maps and local officers have aided in the work. It is recommended that isolated mountain ranges in Batangas and Tayabas be surveyed and reserved promptly. Mt. Macolot on the shore of Lake Taal, Mt. Lobo, and Mt. Malapuño or Malaraya need special attention.

District No. 6: Headquarters, Naga, Camarines Sur.—Provinces: Camarines Norte, Camarines Sur, Albay, Sorsogon, and Catanduanes. Area: 6,665.5 square miles.

The lumbering industry throughout the district had been more or less dull and business in minor products of all sorts had been paralyzed due to the monetary crisis. The big licensees had kept up with their wood operation throughout the year, one having manufactured an average of from 5,000 to 8,000 molave ties a month and had reached 15,000 during the month of May. These ties are sold to the Sugar Centrals of the Visayan Islands and the Manila Electric Railroad and Light Company of Manila. The licensees in the eastern part of Albay had to suspend the manufacture of ties as the Manila Railroad Company had stopped purchasing same.

Fifty licenses were cancelled during the year for non-use and 93 of the 163 licenses were inspected. There were reported 73 violations of licensees amounting to ₱4,168.79 as against 43 and ₱1,841.18 last year, and 242 cases of non-licensees covering ₱7,688.87 as against 327 cases and ₱13,621.81 of last year. Twenty-six ordinary minor product licenses were cancelled and reduction in the number of licenses to 434 was observed. A corresponding decrease of 199 in caiñgin violation from that of last year is also noted.

In addition to the four sawmills reported last year, two sawmills, namely, the Tinalmud sawmill and the Mercedes sawmill begun operations during the year. The Denrica sawmill has just been installed and is under the charge of Mr. Fred L. Pray, former Chief, Division of Forest Management of this Bureau.

The opening of the Tabaco-Manila Railroad line via Pamplona, Pasacao, and Aloneros last October, greatly aided the facility of transportation in the district. The transfer of Paracale Forest Station to Mercedes, Camarines Norte, has proven to be satisfactory.

District No. 7: Headquarters, Iloilo, Iloilo.—Provinces: Antique, Capiz, Iloilo, and Occidental Negros. Area: 8,332.9 square miles.

A few of the big lumber dealers were able to report a fair showing in sales during the year. The majority of the licensees of timber and minor products have, however, been affected by the financial crisis and the abrupt reduction of prices by almost 50 per cent. The demand of lumber and ties for the sugar centrals was greatly curtailed due in part to the dull market and also to certain irregularities in the sales of ties on the part of some dealers. Soft wood species were represented to

be of the first or second group to the great detriment of the interested parties.

There has been a notable decrease in forest violations among licensees and non-licensees. Invoices prepared against the former amounts to ₱4,275.45 and the latter ₱10,715.21. Caiñgin violations had also decreased by 50 per cent. The prosecution for criminal offense of illegal cutters have been tried in the district and had proved effective.

Among the most important work of the district is the inspection of mangrove swamp areas for fishpond purposes. Several questions on the ownership of old fishponds as well as to whose jurisdiction they properly belong were brought up and the Bureau should be prepared for the opposition of the registration of public property. This step is necessary in order to be able to conserve and restock the overcut mangrove swamps in the district.

District No. 8: Headquarters, Zamboanga, Zamboanga.—Provinces: Cotabato, Davao, Jolo, and Zamboanga (except Dapitan and Dipolog). Area: 22,576 square miles.

Lumbering in the district was doing fairly well in the early part of the year but when the financial crisis which today affects the world markets was felt in the Islands, licensees and mill operators were forced to suspend their operations. The low price of abaca and copra, the principal products in the district, has also greatly affected the local lumber business.

Statistics in the report show that 3 per cent of the total output of licensees and mill operators was shipped to foreign countries, 64 per cent to Manila, 19 per cent to Cebu, 7 per cent to Zamboanga, 1 per cent to Dumaguete, 3 per cent to other ports, and 3 per cent was used locally.

A short reconnaissance of the area under ordinary timber licenses of Mindanao Lumber Company in Margosatubig, Zamboanga, and the Port Lebak Lumber Company in Lebak, Cotabato, was made during the year. All concessions and one-third of the small license areas were inspected. Very little activity of holders of small licenses was reported.

There was very little demand for gutta-percha, almaciga, and beeswax. Rattan operation is practically at a standstill. But the local market for firewood and tanbark was fairly active.

The Hercules Lumber Company had a contract to fill timber demands of the Quartermaster, U. S. A., and also a million board feet to a firm in China. The company expects to put up another mill next year to double the output. The Basilan

Lumber Company, the Mindanao Lumber Company, the Port Banga Mill, the Port Lebak Company, the Flecha Point Mill as well as the other sawmills of smaller capacity suspended operations at different months during the year. Only the Olutanga, aside from the Hercules Lumber Company had operated continuously.

Only 18 caiñgin cases were reported to the Provincial Fiscal or Justice of the Peace amounting to ₱1,354.11, and all are by Christian violators. One thousand three hundred and seven caiñgin permits were granted—the increase being due to the paralyzation of the hemp industry. Collective caiñgin permits were also issued during the year.

The Hydnocarpus species, the fruit of which is the source of chaulmoogra oil for the cure of leprosy, is found to be in abundance in Basilan. An effort will be made to collect as many seeds as possible next year.

District No. 9: Headquarters, Puerto Princesa, Palawan.—Province: Palawan. Area: 5,617 square miles.

There were 51 ordinary timber, 27 gratuitous, and 216 ordinary minor products licenses issued in this district. As compared with the number of licenses issued during the previous year, there was a decrease of four ordinary timber licenses; an increase of 12 gratuitous lincenses and 46 ordinary minor products licenses.

Commercial depression which prevailed throughout the Islands, seems to have but very little effect on lumber business in this district. This is shown by the fact that a total of 28,642 cubic meters of timber was utilized in this district according to the invoices received from the Bureau of Internal Revenue, or an increase of 3,028 cubic meters over those of the previous year. The same is true with the minor forest products, an improvement having been noted on the demand for firewood, tanbark, gogo, dyebark, wood oils, and beeswax. This accounts for an increase in the number of licenses issued covering such products.

District No. 10: Headquarters, Tacloban, Leyte.—Provinces: Samar, Leyte (eastern part), Surigao, and Masbate. Area: 11,124.2 square miles.

The lumber business in the district was not seriously affected by the monetary crisis. Besides the 10 sawmills already installed and reported in 1920, 3 others were established during the year. With the exception of 2, all the 11 mills were in operation, 6 intermittently, and 5 continuously throughout the year.

The lumber market, although reported to be dull in the first half of the year, has shown a little improvement from July to December. This is characterized by the gradual influx during this period, of applications for timber licenses. The principal lumber markets in this district are Tacloban, Cebu, Iloilo, Negros, and Manila.

Masbate's production of lumber, however, was greatly curtailed due to the outbreak of rinderpest. Its product composes of ties and logs which are mostly of molave, macaasim, and batete, and sold to Cebu, Iloilo, and Negros for laying out railroads. Logs, mostly of narra, tindalo, and molave, were consigned to Manila and the rest were sold to the mining companies at Aroroy. These mining companies also consumed a considerable amount of firewood cut all over Masbate.

As before, minor forest products were marketed almost locally within the district. Tacloban, Leyte, is the principal market, especially for firewood. The quantity of rattan and other vines for tying purposes produced during the year was greatly reduced due to the weak abaca market although a good deal was shipped to Carigara, Leyte, and other towns where it was employed mostly for baling and fishing purposes.

There has been a notable increase of illegal caiñgins in the district, 630 cases having been reported as against 268 of last year. Some 789 illegal cutting against 352 cases last year were reported, the auxiliary invoices covering ₱19,944.94.

District No. 11: Headquarters, Manila.—Provinces: Bataan, Bulacan, Cavite, Pampanga, Rizal, and Zambales. Area: 5,106.1 square miles.

The lumbering business throughout the district had been practically paralyzed. All the licensees had felt the financial crisis during the year and with the exception of the Cadwallader-Gibson Lumber Company, their operations were greatly reduced if not definitely closed. The sale of manufactured bancas had, however, been constant in the eastern part of Bataan Province. The proposed installation of sawmills at various points had been also suspended.

There has been a big increase in the number of licensees this year. In the course of the inspection of cutting areas some 228 licensees were found to have committed minor violations and were imposed forest charges in the amount of ₱5,927.07. Some 699 non-licensees were detected cutting forest products valued at ₱9,062.68 in Government charges. Of the 117 illegal caiñgins detected, 78 were already acted upon at the close of the fiscal year.

It is recommended that holders of long term concessions be required to replant cut-over and abandoned areas with desirable tree species, such as yacal, narra, teak, etc.

District No. 12: Headquarters, Calapan, Mindoro.—Province: Mindoro. Area: 3,981.6 square miles.

There has been a considerable decrease of timber cut during the year due to the present business depression. A conservative estimate places 60 per cent of the timber cut last year as still lying in the forest without being transported. It is feared that unless the local market is improved, the same will be a total loss.

There has, however, been a notable increase in the number of minor product licenses granted during the year. There had been a constant, although limited demand for firewood, tanbark, rattan, almaciga, buri, diliman, and gogo, all of which find a ready market in Manila and other trade centers at slightly reduced prices.

There has been noted less violation in the cutting areas this year than last year. There is, however, a gradually increasing cogonal area due to the practice of homesteaders to abandon their areas and converting the same to grazing land. Only two illegal caiñgins were detected during the year.

Only seven parcels of communal forests were inspected and established during the year.

District No. 13: Headquarters, Cebu, Cebu.—Provinces: Agusan, Bohol, Bukidnon, Cebu, Leyte (western part), Misamis, Negros Oriental, and Zamboanga (northern part). Area: 20,531 square miles.

The lumber industry in the district has been at a standstill. All over, licensees and sawmill operators had closed and stopped operations due to the financial crisis. Ties and poles have, however, been in demand at the sugar centrals.

A reconnaissance of the coal mining region embracing the watershed of Manga River, north of the Talisay-Minglanilla Forest Reserve as far as Danao, Cebu, was made on March, 1921. A big tract of land had been proclaimed alienable and disposable under Act No. 2874 in the municipality of Ormoc, Leyte.

More interest is being taken on leases of mangrove forest, 92 applications being of record in the district office, 76 of which have already been acted upon.

There is an increase of 478 caiñgin permits over the number issued last year. Two hundred eight caiñgin violations were

reported 156 of which were convicted, 14 acquitted and 6 forest charges collected; or an increase of over 100 per cent in caiñgin violation. This is due to the declaring of public land as private property for taxation purposes and erroneous propaganda by some local officials.

Several cogon fires occurred within the Talisay-Minglanilla Forest Reserve, destroying 600 baguilumbang and a few teak. Some 75 trees were also cut by a caiñginero within the plantation.

DIVISION OF INVESTIGATION

RECONNAISSANCE

The reconnaissance carried on during the year by this Division was confined to the Makiling National Botanic Garden. The class of 1922 spent the months of April and May in intensive reconnaissance on four blocks adjacent to the school. Practically the entire area from the peak to the northern boundary line between Cambontoc creek and the Military reservation was mapped and a timber estimate made. Considerable information of value was obtained and this will serve as the basis of a working plan for the garden.

Topographic and vegetative maps have been prepared for the entire area and also for each of the four blocks into which the area was divided, the scale of these maps being 1:5,000 and the contour interval 10 meters. These maps are the most accurate that have been prepared for the mountain and will serve as a basis for intensive management in the future. Stand tables have also been prepared for each block showing the number of trees and volume by diameter classes for each species in the 1st, 2nd, 3rd, and 4th groups. The work was conducted as follows:

(*a*) Boundary surveys were run for each block by the use of compass, chain, and Abney Hand Level.

(*b*) The blocks were mapped and estimated by parallel strips 200 meters apart running from the northern boundary of the forest. Elevations and bearing were taken at all topographic features on each strip. Notes were also taken regarding vegetation, soil, cultivated areas, trails, etc. Stand tables were then prepared for each strip and the figures in these tables combined to form a table showing the total amount of timber standing on the strips surveyed in each block. These figures were then divided by the total number of hectares estimated thus giving a final stand table showing the stand on the

average hectares. From this final stand table other tables will be made showing the total stand in each block. About 10 per cent of the area of each block was estimated.

The results of this reconnaissance will be submitted in a separate report as soon as all computations and maps are finished.

The class of 1922 showed exceptional ability in this work and a considerable larger area was completed than was at first thought possible. Unless other work of more importance arises in 1922 it is intended to continue the reconnaissance in the Botanic Garden, extending through the Dampalit region and the Calamba Estate and possibly the Santo Tomas area. If this work can be finished in 1922 the area remaining on the southern side of Mt. Makiling can be completed in 1923, thus giving complete information and maps of the entire area. A full report of forest conditions will be prepared when the work has been finished.

DENDROLOGY

All the work done in this subject was in connection with the instruction given in the Forest School. All available data is being collected in order that the records may be brought up to date and obsolete names eliminated and proper common and scientific names recorded for all tree species in the Philippine Islands. The following lists are being checked and brought up to date:

1. Check list of the ferns and flowering plants of the Makiling Region.
2. Check list of woody plants of the Philippines in their family order.
3. Alphabetical list of all common names of woody plants of the Philippines.

Additional collections for the Forest School herbarium were made and considerable material obtained from the Manila Office. At present we have on hand 2,528 botanical specimens representing 114 families, 490 genera, and 1,069 species.

UTILIZATION

a. *Lumbering:*

No work of an investigative nature was done this year in lumbering due to lack of personnel and funds.

During January, the class of 1921 visited the lumbering operations of the Cadwallader–Gibson Lumber Company at Limay, Bataan, in connection with the course in Forest Engineering IV.

b. *Minor Forest Products:*

(1) *Mangrove Swamps—*

The study as outlined and used in 1920, was continued this year.

(*a*) A volume table based on 145 trees was prepared.

(*b*) The per cent of solid wood in stacks of round and split firewood was determined.

(2) *Rattan—*

Various species of rattan are being studied in order to determine their character and qualities for various uses. Studies are also being made to determine the most efficient method of reproduction.

(3) *Charcoal—*

Two charcoal kilns were constructed near the Forest School, one having a capacity of 1½ cubic meters of wood and the other 5 cubic meters. The small kiln produces from 5 to 7 sacks of charcoal and the larger about 25 sacks. It may be noted that the large kiln is more efficient in producing charcoal than the smaller one, although the latter is more satisfactory for experimental purposes. These kilns were constructed by two Japanese laborers who were skilled in charcoal manufacture. To date, there have been two charges in the large kiln and six in the small. The increasing demand for charcoal for various uses has led to the starting of this work inasmuch as very little is known of the properties of the charcoal of various Philippine tree species. Charcoal obtained from known species is at present being analyzed by the Department of Organic Chemistry, College of Agriculture, under the direction of Dr. M. L. Roxas. Charcoal from identified trees will also be sent to various firms in Manila, which use charcoal, particularly those companies that use producer gas in internal combustion engines. It is also planned to send material to the Forest Products Laboratory at Madison, Wisconsin, to determine whether any of this charcoal will be of value in certain of the industries of the United States.

(4) *Other Products—*

Collections and data are also being gathered on other miscellaneous products, such as gums, resins, oils, etc. Some analyses have already been made of these materials at the College of Agriculture under the direction of the department mentioned above. There is considerable information yet to be obtained

on the uses of various minor forest products and this work requires urgent attention due to its importance.

Volumes I and II of Bulletin 22, Minor Forest Products have already been published and Volume III, which is the last of this series, is now in press.

ENGINEERING

The engineering work laid out in 1920 was continued this year. The following work has been done:

(*a*) New topographic and type maps of a portion of the Makiling National Botanic Garden. These were made in connection with the reconnaissance mentioned on page 27.

(*b*) Additional bench marks were established on various parts of the Forest School grounds and on Mt. Makiling.

(*c*) Differential leveling was continued along the main trails on the mountain thus checking former elevations obtained by the Abney Hand Level.

(*d*) The preliminary location of a trail from the first peak to the second peak was made and also of a new trail from the Forest School to the Mud-Spring.

(*e*) Office work was as follows:

(1) Reduction table for Abney Level and chain showing horizontal distance and difference in elevation.

(2) Diagram for obtaining the difference in elevations from vertical angle and horizontal distance. Also another diagram for vertical angle and slope distances.

(3) Complete plane table map of the Forest School.

(4) Forest map of the Lobo region.

WOOD TECHNOLOGY

a. *Durability test:*

The woods in the durability test were examined again. This test is still in progress and those which were still sound consisting principally of molave, yacal, ipil, acle, narra, narig, mangachapuy, treated hand specimens, regular durability test pieces from Lamao, Bataan and all American specimens in Series C were buried again for further study next year.

b. *Wood collections:*

The wood collection was increased this year by a large number of specimens from the Bureau including many foreign hand specimens. At present we have on hand 1,281 hand specimens of Philippine wood and 480 foreign specimens.

FOREST MANAGEMENT (INCLUDING MENSURATION)

a. *Growth studies:*

The annual measurement of 590 trees, comprising the eight principal species found in the Makiling National Botanic Garden, was taken in May and June. Growth figures were computed although no separate report was rendered. Results so far obtained indicate a growth per cent as follows:

Species.	Per cent.
White lauan	2.61
Taluto	1.96
Guijo	1.79
Amugis	1.64
Tamayuan	1.16
Katmon	.72
Camagon	.62
Duñgon	.52
Average	1.38

The annual measurement of all trees in the plantations was continued also. Valuable information is now at hand on the growth in early life of various commercial species.

b. *Working plans:*

The data secured during the reconnaissance held in the last dry season is complete enough to serve as the basis for an intensive working plan of a portion of the Botanic Garden. Four blocks have been covered and topographic and type maps, stand tables, forest and soil description, etc., are now available. In addition the Puting Lupa Block has been divided into ten compartments and an intensive study of each compartment is made.

SILVICULTURE

a. *Reforestation:*

During the year 1921, no planting was done in the reforestation plots established in previous years due to the lack of available funds. It was, however, possible to make an inspection of some of the plots in the Provinces of Ilocos Sur, Ilocos Norte, and Zambales, for the purpose of determining possible extension and improvement work to be done in the future. During this inspection, it was noted that the problem of reforesting the cogon areas is solved only by affording proper protection from fires and grazing. Until the areas planted are given proper care, very little or no success can be expected from this work.

(1) *Ilocos Reforestation*—

The plots visited during the year were those at Laoag, Sarrat, Santo Domingo, Vigan, Santa, and Santa Maria. Those not inspected were Pasuquin, Batac, Paoay, Sinait, and Lidlidda. The failure to inspect all of the plots was due to their inaccessibility during the rainy season.

In general, the plots are in good condition, considering the fact that they were not given proper protection from fire and grazing. Some of the ipil-ipil plants have already reached the height of about five meters and are bearing fruit. It is believed that in about five years' time the plots at Laoag and Sarrat will be completely covered with ipil-ipil.

The nurseries at Caniaw and at Santa are in a satisfactory condition. In both of these there are approximately 5,000 seedlings and transplants of narra, palomaria de la playa, ipil, teak, and molave ready for next year's planting.

Undoubtedly the crying need of the region is for timber and firewood. The economic condition of the people as regards to their timber supply is going from bad to worse. They are practically facing a timber famine. The reforestation of the Ilocos region is, therefore, a great economic problem that the Government should handle immediately.

The most urgent needs of the project are:

(*a*) Proper protection from fire and grazing.

(*b*) Close supervision of the work. This needs a man especially detailed for the work.

(*c*) Establishment of a nursery at Laoag.

(2) *Zambales Reforestation*—

Three of the four plots established in the Province of Zambales were inspected. The plots of the towns of San Narciso and San Antonio have been burned over and grazed resulting in a total failure. The plots of San Felipe had about 75 per cent success. Some of the plants were about two meters tall and bearing fruit. A nursery is needed in San Felipe. Proper protection of the areas planted is the most urgent need of the project.

(3) *Cebu Reforestation*—

No work has been done in the reforestation of the Talisay-Minglanilla Forest Reserve. Not even one guard has been employed to patrol the area, on account of the lack of funds. This has proven to be a mistake as squatters are beginning to clear off young molave trees.

(4) *Mt. Arayat Reforestation*—

A small amount of teak seed was planted by the caiñgineros in their clearings on the mountain, but the planting was almost a total failure. The necessity of reforesting the cogonal areas of Mt. Arayat has been emphasized in previous reports.

(5) *Cotabato Reforestation*—

No work has been done this year on account of the lack of funds. It is planned to renew the project next year.

(6) *Corregidor Reforestation*—

With the coöperation of the military authorities, the work in Corregidor was started on June 16, 1921. The work accomplished consisted of the preparation of an outline of a plan to carry out the planting project; the establishment of a nursery, one hectare in area; teaching a short course in forestry at the vocational school; planting; and the marking and identification of trees along the main road and around the officers' quarters. After putting the project in good running order, it was left with the military authorities for continuation.

(7) *Makiling Reforestation*—

There was comparatively little work done this year due to the lack of transplants, there being only 14,149 plants and 1⅓ gunny sacks of seeds planted on the caiñgins. The percentage of success is low due to the lack of funds for labor to perform the planting efficiently, coupled with the lack of a trained man to supervise it.

(8) *Summary of Reforestation*—

All of the projects enumerated above are unfinished and they should be carried on next year. Urgent pending projects to be carried out next year are the following arranged in the order of importance:

(*a*) Establishment of forest nurseries at San Felipe and San Antonio, Zambales.
(*b*) Establishment of a forest nursery at Laoag, Ilocos Norte.
(*c*) Establishment of reforestation plots in La Union.
(*d*) Planting in the Salinas Forest Reserve, Nueva Vizcaya.
(*e*) Inspection of the proposed reforestation area near Bamban, Tarlac.
(*f*) Inspection of the Jolo Teak Reservation.
(*g*) Inspection of the Cagayan Valley for reforestation.
(*h*) Inspection of the Friar Lands at Sucat, Rizal.

Other projects which will require attention within the next few years are:

(*a*) Reforestation of the Agno River watershed to prevent erosion and excessive run-off.

(*b*) Reforestation along the Lagnas River in Tayabas where floods annually cause numerous washouts and much destruction of property.

In conclusion, it may be stated that next to the actual administration of the Philippine forest, reforestation is the most important single problem with which we have to deal and therefore requires immediate attention and large appropriations for the work.

b. *Nursery:*

As mentioned in the 1920 report the nursery was moved from the old site near the Foxworthy cottage to a location nearer the school. It is situated in Hectares D and F. This area has been improved considerably during the past year by additional plantings, the construction of a nursery house and the installation of a pipe line to all parts of the area. Cement culverts were constructed in necessary places.

c. *Arboretum:*

New plantings are being made in the arboretum from time to time as material becomes available.

d. *Reproduction Studies:*

The reproduction plots established in the logged over areas of the Cadwallader–Gibson Lumber Company in Bataan were inspected in January. Six of these plots were established in 1913 and the rest in succeeding years. There are thirteen plots and all were found.

e. *Seed Collection and Distribution:*

More seed was received this year than in 1920. Considerable amount was collected here by the students, guards, and laborers and numerous consignments were received from the field force. Large quantities of teak and baguilumbang were also received. The field force is to be complimented for its coöperation in furnishing the seed. However, we are still unable to meet the demands made upon us for seed and will require considerable more in 1922 than we have in the past year.

During the year, 3,044 liters of seed of various species were received here, 3,012 liters from the Philippines, and 32 liters from foreign countries.

The following is of great interest:

Two lots of seeds, one of Hydnocarpus hutchinsonii and the other of Hydnocarpus anthelmintica (family Tiaceae) were received, the former from Basilan Island and the latter from the "Jardin Botanique" of Saigon, China. Seeds of these spe-

cies yield a very excellent substitute for chaulmoogra oil which is used in the treatment of leprosy.

The following quantities of tree seed were distributed during the year:

Species.	Destination.	Quantity in liters.
Ipil-ipil	Pangasinan	242
Do	Pampanga	140
Do	Bureau of Forestry, Manila	30
Do	Bulacan	60
Teak	Ilocos Sur	80
Do	Makiling reforestation	80
Palms	Fort Myers, Florida	39
Various species	Corregidor reforestation	1,210
Miscellaneous	Numerous destinations	27
Total		1,908

f. *Plant Accessions and Distribution:*

Approximately 7,100 plants were received during the year, representing over 50 species. These were obtained from the following sources:

	Plants.
Forest Nursery, Baguio	100
College of Agriculture	500
Bureau of Agriculture	6,500
Total	7,100

Most of these were redistributed to various places for planting, especially to Corregidor Island.

During the year, about 35,950 plants including timber and ornamental tree species, bamboo, palms, vines, and herbs were distributed as follows:

Destination.	Number.
Corregidor Island reforestation	17,000
Caniacao Hospital (Cavite Naval Yard)	500
Camp Stotsenberg	50
Schools (Arbor Day)	85
Oriental Negros	25
Makiling reforestation	14,150
College of Agriculture	60
Manila (Conservation League)	80
Miscellaneous	4,000

With our increased nursery facilities we will probably be able to furnish more plants during 1922.

g. *Plantations:*

No new plantations were established here during the past year due to lack of funds and labor.

h. *Cost Records:*

The cost records of seed collection and planting are still being kept up to date as they furnish valuable information in regard to collection, soil preparation, planting, etc., which will be of value in reforestation.

i. *Studies:*

In addition to the various studies mentioned under other headings in this report, work has been started on a complete silvicultural investigation of several commercial timber species, as follows: teak, molave, narra, yacal, and lumbang. This will be continued throughout the year 1922 and additional species taken up. Some important information has already been obtained.

FOREST ENTOMOLOGY

Professor H. E. Woodworth, of the College of Agriculture, has been conducting research work in this subject with the assistance of the ranger personnel of this Division. Valuable information has been secured in close proximity to the Forest School on insects which damage timber. Collections have been made and breeding experiments are being carried on at present. Much of this material is unknown and has been sent to other countries such as Austria, Germany, France, and the United States for identification by specialists in the various insect families.

PUBLICATION

As mentioned under Utilization b. (4), Volumes I and II of Bulletin No. 22, Minor Forest Products, were issued this year and Vol. III is at present in press.

No other publications were issued this year. A handbook for Philippine Forest Rangers is at present being prepared and it will probably be ready for press by December, 1922.

The Division has considerable information in its files which is being brought together and augmented by new information so that it will serve as a basis for future publications.

The publication of the Ranger resulted in the discontinuance of the Mountain Echo. It is hoped to transfer the Echo to Los Baños for publication thus making it the official organ of this Division and of the Forest School. It would then become a medium of educational value. Also the ranger force could keep in touch with the work here and secure information on various studies which are being carried on.

ADMINISTRATION

a. *Personnel:*

The present force of this Division consists of one Chief of Division who is In Charge of the Forest School, one District Forester, one Forester in Charge of Silvicultural Investigations, one Forester on Special work in Engineering, one Forester in Charge of Reforestation, three Senior Rangers and three Rangers on special work, one clerk, and one librarian. Of the above, Forester Cuzner, Ranger Seguerra, and Clerk Aspiras are recent additions to the staff.

The non-technical force consists of three forest guards, four nurserymen, and approximately fifteen laborers. The guards are used in the administration of the Makiling National Botanic Garden and for making collections. The nurserymen are all working in the nursery at the school.

b. *Makiling National Botanic Garden:*

The administration of the Botanic Garden was transferred from District 5 to this Division on April 15, 1921. Since then efforts have been made to improve the forest by restricting cutting as much as possible. The extensive valuation surveys taken during the reconnaissance showed the necessity of stopping all logging except for designated species which are suitable for some purposes but these are not much sought after by licensees who prefer species which are now not represented on the mountain by seed-bearing trees.

The collectors of orchids and bird nest ferns are gradually destroying all such plants in the vicinity of trails but no adequate protective measures can be taken without more men to follow up and enforce any regulations which may be imposed. Students of the College of Agriculture and of the Forest School conduct their collecting work off the main trails in accordance with a long established policy of these institutions.

Hunting has been prohibited in accordance with the Executive Order of the Governor-General creating the Botanic Garden. However, some poaching has been done due to lack of guards for patrol work.

THE WORK IN BAGUIO

NURSERY AND PLANTATION

The work in the nursery consisted of preparing seed and transplating beds, manuring, cleaning, mulching, and making nursery frames and seed flats for the propagating house. A

garage for the motorcycle used in fire-fighting was built and considerable amount of repair work was also done. The work of placing semi-permanent labels in the nursery and especially in the Experimental Plantation was pushed this year to completion.

The planting this year consisted of about 18,930 cuttings of such much used and valuable species as the cypress, camphor, *Hydrangea, Pyrus, Viburnum,* etc. The success of this year's planting of cuttings is only 6 per cent.

Several shipments of foreign seeds including the valuable and interesting genera of *Cedrela, Dalbergia, Rhododendron, Pistacia, Juglans, Aleurites,* and *Cinnamomum* were obtained, but in all cases the seeds were old and failed to germinate. Of all the exotic species from various sources, a germination of less than 5 per cent was secured.

During the year, 2,929 plants were distributed free of charge, as follows:

For city planting	761
For private parties	527
For other Government branches	346
For experimental plantation	1,295

There are on hand at the nursery 7,673 trees, 4,675 shrubs and small trees, and 4,479 herbaceous plants for use in the planting season of 1922.

The following species were planted in the plantation this year: *Bignonia catalpa, Callistemon salignus, Cassia corymbosa,* Kapok (*Ceiba pentandra*), Camphor, *Pinus insularis,* and Idog (*Viburnum odoratissinum*). Kapok (*Ceiba pentandra*) does not promise to succeed in the altitude of Baguio.

Another reforestation experiment is that started at Km. 3 on the Baguio–Trinidad Road. Here a steep hill, totally denuded and with bare stones showing from its top to half way down its slopes, was planted up to *Eupatorium* with the hope that these will suppress the grass which is set on fire every year.

Of the species given in last year's report, the *Castanea japonica* and *Juglans cordiformis* are reported to have died and *Umbellularia californica,* the Japanese cherries, and *Pithecolobium dulce* as doing poorly. All the others are in healthy condition.

FORBES PARK

The addition of stone benches to the permanent features of Forbes Park was completed this year.

The young stands of pine were pruned of their lower branches.

Flower beds were added this year to give interest and color to the scenery but this was only possible near the Forest Station

where some degree of control can be exercised over the Park users.

Some of the interesting plants in the park were labelled conspicuously.

The swimming pool was enlarged and deepened this year.

The Kiosko at the picnic grove was improved in appearance and usefulness by the placing of a water proof board roofing.

The 200 chestnut trees set in 1910 in Forbes Park had fruited this year for the first time but due to the closeness of the original planting, it had been found necessary to transplant them anew to relieve crowding.

CITY COÖPERATION

The City of Baguio appropriated this year the sum of ₱5,000 for city planting and maintenance.

The city force was employed in watering and cleaning around the plants, trimming and pruning trees in preparation for the windy season, digging up plants in Forbes Park, and also in preparing the trails and bridges for the tourist season.

The District Forester has coöperated actively with private parties who have signified their desire to beautify their home surroundings.

FIRES

The acquisition of a motorcycle has facilitated the transportation of fire fighters to the places where needed. There were 44 fires put out this year (38 last year) with an area of 65½ hectares burnt over while last year the area burnt over aggregated 108 hectares. The fire damage has been reduced to half and with better methods of fire detection and reporting, the damage may be reduced considerably.

FOREST CONSERVATION

No reports of shortage of firewood and lumber were received from any source this year.

The demand for firewood, however, is larger than last year's, making it imperative that the plans to reduce consumption of firewood be carried out.

The cutting of firewood within the city limits has been greatly reduced during this year, being only about 1,700 cubic meters.

There is a full realization of the lumber and firewood situation in Baguio by other Government officials specially the Mayor of the City. It is also gratifying to note a laudable degree of understanding and appreciation of the Bureau's forest policy by others with the result that this year there was a smaller number of requests to deny, such as for marking trees on closed

areas, for cutting immature trees and saplings, for caiñgins on wooded lands, etc.

Thus the Bureau of Forestry has partially succeeded in averting the wood crisis in Baguio by following the program set forth in the working plan of the District Forester for the Baguio Working Circle. But the augmenting of the firewood supply by planting fuel producing trees is a problem that remains to be solved by this Bureau.

FOREST SCHOOL

ENROLLMENT

The school work during the year 1921 started on January 10, after the Christmas vacation. The enrollment consisted of fifteen seniors and twenty-six juniors, four of the latter being British North Borneo pensionados. The graduation exercises of the class of 1921, consisted of a class day program held on the afternoon of March 18, and the commencement exercises on March 19, 1921. After a short talk by the Dean of the Forest School, diplomas were presented by Acting Governor-General Yeater with appropriate remarks. Other speakers during the commencement exercises were Prof. Cuzner, who was then at the College of Agriculture, and Mr. Justino Seguerra, the Medalist, who represented the class. The other honor men of the Class of 1921 were Gregorio Zamuco, first honor man and Jose Makil, second honor man.

The school year 1921–1922 opened on April 11, with an enrollment of 30 juniors, who began their summer work in botany immediately thereafter. Of these, four resigned before the opening of the regular school year in June and four more were dropped on account of poor scholarship. To fill these places, seven students who had had Botany I at the College of Agriculture were enrolled. Five of these were British North Borneo pensionados.

The senior forestry students spent the summer term in making a reconnaissance of a portion of the Makiling National Botanic Garden. Field work began on March 29, 1921 and ended on May 14, 1921. One member of the senior class, who was a Borneo pensionado, was dropped due to poor work.

At the end of the first semester, two members of the junior class were dropped for unsatisfactory work, and one was forced to resign due to poor health. The enrollment at present consists of 25 seniors, two of whom are British North Borneo pensionados and 26 juniors, four of whom are also British North Borneo pensionados. Among the class of 1923, two are Igorots.

The following tabulation shows the present enrollment by provinces at the Forest School.

Cagayan	2	Bulacan	1
Ilocos Norte	4	Laguna	4
Ilocos Sur	1	Camarines Sur	1
Abra	2	Albay	1
Isabela	2	Sorsogon	2
Mountain Province	2	Iloilo	3
La Union	2	Samar	2
Pangasinan	6	Leyte	3
Nueva Ecija	1	Cebu	2
Tarlac	3	Surigao	1
Zambales	5	Misamis	1
Total			51

FACULTY

All classes were taught at the Forest School this year. No work was given at the College of Agriculture on account of the loss of time in going to and fro. Furthermore the College of Agriculture has been handicapped due to lack of instructors and was therefore unable to give any outside courses.

No vacancies have occurred in the Forest School faculty this year. Two new members have been added to the staff, namely, Harold Cuzner, Professor of Dendrology; and Justino Seguerra, Assistant in Forest Engineering and Management.

IMPROVEMENTS

The following improvements were made at the Forest School during the year 1921.

(*a*) Installation of a water distillation plant. This is a great improvement as it furnishes good drinking water for all the students and faculty.

(*b*) Repair of the Forest School road. The repair of the Forest School road was commenced and the unfinished portion back of the school completed.

(*c*) The pipe lines were extended to the quarters and the new nursery, thus furnishing water at places where it was badly needed.

(*d*) A short cut trail from the Forest School road to the swimming pool was constructed by the students in connection with their classwork in Engineering IV.

(*e*) The hut on the top of Mt. Makiling was repaired by the students early in the year.

(*f*) A new nursery containing a potting house, seed and transplant beds, was established near the school in order to

be readily accessible for student work and to carry on special experiments and care for important species.

(*g*) A nursery house with concrete floor, bamboo walls and nipa roof was constructed.

(*h*) The excavation under the Forest School was continued for 30 feet, thus giving ample space for storage and enabling us to construct two bodegas where stock may be kept under lock and key.

(*i*) The student dormitories were completely re-roofed with nipa inasmuch as they were in bad shape and badly leaking.

(*j*) Some planting was done along the Forest School road and around the quarters.

(*k*) Considerable minor repairs were made on and in the Forest School building, faculty cottages, mess hall, dormitories, etc., in order to keep them in good shape.

(*l*) Collections for the Forest School museum were continued throughout the year and considerable material of value gathered.

(*m*) The student gardens have been extended and kept under constant cultivation, thus serving as a source of supply for the Forest School mess.

SPECIAL FEATURES

The class of 1922 spent six weeks on reconnaissance work in the Makiling National Botanic Garden and considerable information of value was obtained. The maps especially are excellent and will serve as a basis for a complete map of the Botanic Garden when the rest of the reconnaissance is finished. This phase of the work is discussed under the heading "Reconnaissance" in the annual report of the Division of Investigation. The class of 1921 spent two weeks at Limay, Bataan, in a study of lumbering operations. The reproduction plots established there in the year 1913, were inspected by the class.

During the year the school was visited by many prominent people and organizations, among which may be noted: The Java Educational Commission; the Chinese Educational Commission; Acting Governor-General Yeater; Capt. Wettengel, U. S. Navy, Governor of Guam; Major-General Leonard Wood, Governor-General of the Philippine Islands; Guy Potter Benton, President of the University of the Philippines; and Capt. Wooley, of the British Forest Service.

The visit of Major-General Wood was marked by the planting of two memorial trees, one for Theodore Roosevelt and the other for General Wood.

ADVANCED COURSE

The advanced course leading to the degree of Bachelor of Science in Forestry was approved by the University Council and the Board of Regents during the year and it is hoped that the work in this course may be started by June, 1922, provided sufficient personnel and equipment can be secured. Not more than ten students can be cared for the first year due to the lack of equipment and class rooms.

Employment of Forest School graduates as of December, 1921

Employment	Class of—										Total	Percent
	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921		
Bureau of Forestry	8	15	18	8	11	13	16	19	17	15	140	64
Other Bureaus	.....	1	4	3	1	.....	.....	.....	1	.....	10	5
Officers, U. S. Army	.....	.....	.....	.....	1	1	.....	.....	.....	.....	2	1
Officers Constabulary	2	4	1	.....	.....	.....	.....	.....	.....	.....	7	3
Students, U. S.	2	1	1	2	1	1	2	.....	.....	.....	10	5
Students, U. P.	.....	.....	.....	2	2	.....	.....	.....	1	.....	5	2
Lumber business	2	2	3	1	1	1	.....	1	1	.....	12	5
Private business	2	4	.....	2	1	3	1	.....	.....	.....	13	6
Borneo Forest Service	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	2	1
China Forest Service	.....	.....	1	1	3	.....	1	.....	1	.....	7	3
Guam	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	2	1
Deceased	.....	1	1	.....	.....	1	.....	.....	.....	.....	3	1
Unknown	1	1	1	1	1	1	.....	.....	.....	.....	6	3
Total	17	29	32	20	24	21	20	20	21	15	219	100

A list showing the number of graduates from the provinces in the Islands and from China and Guam

Cagayan	12	Camarines	11
Ilocos Norte	9	Albay	6
Ilocos Sur	13	Sorsogon	2
Abra	1	Mindoro	2
Isabela	5	Capiz	8
La Union	4	Iloilo	10
Nueva Vizcaya	2	Samar	1
Pangasinan	26	Leyte	2
Nueva Ecija	7	Cebu	4
Tarlac	8	Bohol	3
Zambales	7	Occidental Negros	5
Pampanga	7	Oriental Negros	4
Bataan	2	Surigao	1
Bulacan	8	Zamboanga	1
Rizal	8	Misamis	2
Manila	2	Palawan	1
Cavite	4	China	10
Laguna	5	Guam	2
Batangas	6		
Tayabas	8	Total	219

DIVISION OF SAWMILLS AND UTILIZATION

While financial and market conditions existing during the year have brought a decrease of some 10,000,000 board feet in the

volume of lumber sales as compared with the year 1920, production at the mills has shown material increase amounting to over 3,000,000 board feet for the mills at which regular scaling is carried on.

In spite of this increase in the scaling work at the mills at which scalers are stationed and the need of extending the work to those mills at which permanent scalers have not been previously stationed, the personnel in this division devoting the greater part of its time to scaling work has only been increased to 22 rangers and 28 guards as compared with 21 rangers and 24 guards in 1920.

Of this personnel the majority of the rangers devote a large portion of their time to other administrative and technical work while a large number of the guards are employed on a temporary basis under the provision of the appropiation act which permits the employment of personnel with savings from the regularly provided positions.

This has created a most undesirable feeling of uncertainty among the guard employees who are constantly on the lookout for positions outside of the Bureau with the natural idea that they are liable to be dropped at any time when they are kept on with only temporary appointments which must be continually renewed.

While it is true that new men can always be secured to replace those leaving the Bureau, the character of the work performed requires that each new appointee must spend considerable time at Government expense learning the work under competent instructors before he can be allowed to do regular scaling work which means a very considerable loss in money, time and efficiency of the personnel.

For this reason, as stated in previous reports, it is very desirable that special provision be made in the appropiations for a permanent corps of guard-scalers employed on a Civil Service rating who will devote their time under the supervision of the rangers or officers in charge of stations to the scaling of logs cut by licensees and in assisting the rangers in checking and supervising license areas.

During the year there were 52 mills in operation on license areas while regular scaling of all timber cut could only be carried out at 26 of these mills. Periodic scale and checking of an additional fourteen mills was carried on as forest officers were able to visit them during their field trips and at these 40 mills a total of 379,357 cubic meters of timber was scaled from January 1 to December 31, 1921, as compared with some 318,906 cubic meters during the same period of 1920.

GRADING

Through lack of funds and personnel, no progress has been made in the further training of lumber inspectors to take care of grading work.

With the trouble which has been experienced from the shipment of several cargoes of ungraded lumber to the United States a growing realization of the need of this class of work has been noted among the lumbermen which, it is hoped, will result in definite action being taken through the Philippine Lumbermen's Association for the general adoption of standard grading rules.

Over 1,000,000 board feet of ties and lumber have been inspected during the year at the request of various licensees in connection with their deliveries on contracts but practically no real grading work was done in these inspections, the certificates issued being confined to a statement of the species and merchantable condition of the timber.

Information has been received that several dealers have been negotiating contracts for delivery of export lumber specifying government inspection during the coming year but nothing can be done to meet requests for such an inspection involving the services of trained graders unless provision is made in the appropriation for the employment of additional guards to replace the rangers, to be trained in grading work, in carrying on the administrative work to which these rangers are at present assigned.

LUMBERING

With the opening of new mills during the year and the improvements made by a number of the old companies during the previous year, the production from the larger companies at which regular scalers are stationed has shown an increase of some 7,200 cubic meters (3,000,000 bd. ft.) although the continued depression of the market has brought a decrease in sales of 9,906,000 board feet during the same period from January to December, inclusive.

Reports from 21 companies show the following figures:

January 1 to December 31

Year.	Log scale.	Mill tally.	Sales.	Forest charges.
	Cu. m.	*Cu. m.*	*Cu. m.*	*Pesos.*
1920	309,737.28	221,286.21	218,694.54	265,805.16
1921	352,368.53	228,505.26	195,331.09	322,010.56

The accumulation of large stocks of lumber in the yards with a very slow market during the last half of the year compelled

several mills to close temporarily although logging operations were continued so that a considerable stock of logs as well as lumber were on hand at the end of December, as indicated by the large scale compared with the mill tally.

During the year mills were installed by Rosenstock, Wrentmore and Reynolds, P. Chavez y Hermanos, Albert Bryan, Inc., E. A. Gebert, F. A. Percy, and Luis Martinez, while work was started or plans made for installation of new mills by the Butuan Sawmill, Inc., Albert Bryan, Inc., and Milbuk Timber Company.

LOCAL MARKETS

While sales have fallen off during the year as indicated in the table of lumber shipped given below, the steady, though relatively slow demand together with the continued large production of mills in operation and interest in installation of new mills, indicates a confidence in the lumber market and an underlying demand for lumber which will create a very active market as soon as a more normal financial situation will permit the resumption of building operations which are held up by lack of money.

The following table shows, by species and destinations, the volume of lumber sold by twenty-one of the companies from which regular reports are received:

Lumber shipped by twenty-one lumber companies from January to December, 1920 [a]

[In board feet.]

Destination.	Red lauan and tanguile.	White lauan.	Apitong.	Guijo.	Manga-chapui.	Lumba-yau.	Yakal.	Palosapis.	Miscellaneous.				
									First group.	Second group.	Third group.	Fourth group.	Total.
United States	3,942,736	1,922,384	187,826	.....	.....	559	.....	.....	.....	.....	.....	15,094	6,068,599
Shanghai	876,564	425,466	130	.....	.....	.....	.....	.....	.....	.....	.....	4,103	1,306,263
Hongkong	.....	212,227	.....	.....	.....	.....	.....	.....	11,293	.....	.....	.....	223,520
Australia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,511	2,511
Africa	11,087	13,601	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24,688
Manila	11,729,112	19,910,705	12,927,652	1,825,151	162,345	2,343,415	1,617,526	646,415	684,102	13,415	564,082	3,942,468	56,366,388
Luzon ports	157,047	283,556	463,163	47,851	1,249	.....	4,186	60,587	15,437	3,880	1,000,050	169,276	2,206,282
Cebu	1,006,224	501,752	706,779	116,520	28,290	244,101	75,900	.....	4,569	7,294	34,642	420,846	3,146,917
Iloilo	483,751	898,828	74,265	7,348	592	.....	578	.....	.....	.....	.....	103,840	1,569,202
Visayan ports	1,173,268	504,039	395,406	9,293	.....	23,195	1,245	471	.....	.....	1,866,587	105,383	4,078,887
Zamboanga ~~ports~~	126,917	535,609	280,986	96,282	19,560	438,333	54,587	.....	9,098	51,736	54,763	201,455	1,869,326
Davao	50,998	95,000	814	1,641	.....	1,815	30	.....	136	.....	.....	115,146	265,580
Mindanao and Sulu ports	650,131	673,066	509,995	103,664	37,197	180,842	41,228	14,735	5,978	4,754	947	255,766	2,478,303
Unclassified ports	5,324,259	6,035,708	1,709,329	9,222	3,526	27,668	4,069	.....	5,154	.....	.....	1,085	13,120,020
Total	25,532,094	32,011,941	17,356,345	2,216,972	252,759	3,259,928	1,799,349	722,208	735,767	81,079	3,521,071	5,336,973	92,726,486
Mill tally	28,057,496	29,840,094	19,592,357	2,931,265	347,074	2,457,750	1,910,599	1,174,166	831,409	518,688	3,223,256	2,941,199	93,825,353

[a] Three of these companies had no mill operations on public land.

Lumber shipped by twenty-one lumber companies from January to December, 1921

[In board feet.]

Destination.	Red lauan and tanguile.	White lauan.	Apitong.	Guijo.	Manga-chapui.	Lumba-yau.	Yakal.	Palosapis.	Miscellaneous.				
									First group.	Second group.	Third group.	Fourth group.	Total.
United States	1,906,861	1,361,916	448,810	182,564	.....	2,018	.....	30,563	.....	.....	.....	53,033	3,985,765
Africa	7,657	5,399	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,056
Australia	336,797	199,613	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	536,410
England	66,101	32,827	.....	.....	.....	30,054	.....	.....	.....	.....	.....	.....	128,982
Shanghai	1,445,388	1,044,674	180,024	.....	.....	46,288	.....	.....	.....	.....	.....	.....	2,716,374
Manila	12,062,736	17,595,805	12,663,158	1,976,701	258,654	1,776,920	1,515,118	352,655	416,117	144,325	1,455,545	4,458,360	54,676,094
Luzon ports	272,744	424,508	557,462	60,453	7,134	32,811	3,053	150,541	16	1,029	349,337	1,994,811	3,846,765
Cebu	1,180,340	949,514	1,542,656	151,213	30,362	354,113	157,506	.....	2,698	1,500	4,989	686,861	5,061,752
Iloilo	1,021,230	1,035,722	452,798	20,761	7,403	12,713	19,721	.....	232	39,816	68,850	.....	2,679,246
Visayan ports	3,147,172	153,108	1,061,975	28,076	2,393	37,990	9,691	.....	301	.....	456,640	872,585	5,769,931
Zamboanga	352,964	317,975	208,968	76,780	9,322	349,782	113,718	.....	18,622	3,007	49,829	301,319	1,802,286
Davao	50,162	11,191	10,806	.....	.....	.....	897	.....	.....	.....	1,613	.....	74,669
Mindanao and Sulu ports	684,092	312,750	170,095	83,127	15,056	83,291	59,439	.....	15,904	2,348	14,318	81,502	1,521,922
Total	22,534,244	23,445,002	17,296,752	2,579,675	330,324	2,725,980	1,879,143	533,759	453,890	192,025	2,401,121	8,448,471	82,820,386
Mill tally	32,416,640	26,586,865	20,931,782	3,474,489	480,205	2,167,043	2,399,314	858,443	870,464	866,160	3,702,631	2,132,194	96,886,230

The figures in these tables show local shipments of 85,101,000 board feet for 1920 and 75,440,000 board feet for 1921 as compared with 7,626,000 board feet and 7,381,000 board feet, respectively, of foreign shipments but while these figures indicate the approximate proportion of local and foreign sales, the actual foreign sales are somewhat larger owing to the fact that a number of shipments from these mills reported as sent to Manila were actually reshipped to foreign ports, accurate data for which could not be secured. These shipments are, however, included in the table of total exports of lumber from all sources.

FOREIGN MARKETS

The actual volume of exports during 1921 has decreased below that of 1920 by some two million feet while imports have shown an increase of some three million feet. Much of the increase in imports is made up of ties purchased from the United States by the sugar centrals to rush the completion of their railroads when their delay in arranging for cutting with local contractors left them short of ties for completion of the roads within contract time limits. Over 90,000 ties amounting to some 5,000 cubic meters were imported during the early part of the year to meet this rush demand for ties. With these imports of ties and the increase in lumber imports due to the decrease in prices of American lumber and freight rates the imports have increased from 18,488 cubic meters for 1920 to 25,520 cubic meters for 1921.

While the exports have dropped from 32,694 cubic meters for 1920, to 27,807 cubic meters for 1921, considerable development has taken place in the foreign markets other than the United States, exports to Australia showing a very sharp increase in addition to increases in shipments to Hongkong, China, Japan, and British Indies and new shipments to European countries and Singapore.

The following tables show the imports and exports as recorded by the Bureau of Customs, by species and countries, during the past four years:

188710——4

Lumber and timber exported from the Philippine Islands

Species.	1921			1920			1919			1918		
	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.
United States:												
Narra timber	106	44,944	₱6,450									
Tangile timber										31	13,144	₱1,015
Miscellaneous timber	18	7,632	1,101									
Narra lumber									₱50			
Tangile lumber	1,898	804,752	150,663	6,875	2,915,000	₱557,388	3,515	1,490,360	260,207	3,268	1,385,632	229,494
Almon lumber	2,352	997,248	124,843	1,892	802,208	111,877	459	194,616	18,504	1,056	447,744	35,450
Lauan lumber	4,576	1,940,224	438,892	10,014	4,245,936	446,879						
Miscellaneous lumber	400	169,600	21,201	43	18,232	3,077	4,836	2,050,464	251,840	2,656	1,126,144	117,679
Total	9,350	3,964,400	743,150	18,824	7,981,376	1,119,221	8,810	3,735,440	530,601	7,011	2,972,664	383,638
Hongkong:												
Miscellaneous timber				48	20,352	1,000	252	106,848	5,912	168	71,232	10,815
Narra lumber										1	424	163
Almon lumber	40	16,960	1,865	88	37,312	2,436				2,693	1,141,832	42,787
Lauan lumber	158	66,992	6,281	501	212,424	19,169						
Miscellaneous lumber	2,214	938,736	87,388	416	176,384	37,324	1,278	541,872	52,572	1,165	493,960	37,279
Total	2,412	1,022,688	95,534	1,053	446,472	59,929	1,530	648,720	58,484	4,027	1,707,448	91,044
China:												
Narra timber							3	1,272	360			
Miscellaneous				1	424	250	43	18,232	5,050			
Narra lumber	1	424	150							10	4,240	1,032
Tangile lumber	130	55,120	16,815	24	10,176	3,714	535	226,840	17,890	8	3,392	395
Almon lumber	768	325,632	33,498							10	4,240	993
Lauan lumber	7,800	3,307,200	276,941	5,900	2,501,600	247,608						
Miscellaneous lumber	1,463	620,312	75,075	2,361	1,001,064	103,698	4,111	1,743,064	147,139	5,457	2,313,768	163,809
Total	10,162	4,308,688	402,479	8,286	3,513,264	355,270	4,690	1,989,408	170,439	5,485	2,325,640	166,229
Japan:												
Narra timber				1	424	150						
Miscellaneous timber			40	21	8,904	4,118	90	38,160	1,982			
Narra lumber	4	1,696	312			11			100			
Tangile lumber			12				5	2,120	500	7	2,968	1,130
Almon lumber												20
Lauan lumber	105	44,520	4,893									
Miscellaneous lumber	63	26,712	1,251	15	6,360	5,582	7	2,968	1,146	4	1,696	733
Total	172	72,928	6,508	37	15,688	9,861	102	43,248	3,728	11	4,664	1,905

Australia:												
Tangile lumber	38	16,112	2,252	117	49,608	10,301	22	9,328	1,677	4	1,696	174
Almon lumber	2,644	1,121,056	152,852	1,102	467,248	57,285	446	189,104	18,812	.....	.....	.....
Lauan lumber	1,710	725,040	81,358	480	203,520	25,850	.....	.....	.....	.....	.....	.....
Miscellaneous lumber	85	36,040	4,464	.....	.....	.....	99	41,976	6,296	9	3,816	252
Total	4,477	1,898,248	240,926	1,699	720,376	93,436	567	240,408	26,785	13	5,512	426
United Kingdom:												
Narra lumber	.....	.....	.....	1	424	192	.....	.....	.....	.....	.....	.....
Tangile lumber	195	82,680	18,386	793	336,232	58,764	.....	.....	.....	.....	.....	.....
Lauan lumber	799	338,776	50,669	1,168	495,232	76,913	.....	.....	.....	.....	.....	.....
Miscellaneous lumber	128	54,272	10,139	459	194,616	34,777	.....	.....	.....	.....	.....	.....
Total	1,122	475,728	79,194	2,421	1,026,504	170,646	.....	.....	.....	.....	.....	.....
Canada:												
Almon lumber	.....	.....	.....	94	39,856	6,000	.....	.....	.....	.....	.....	.....
Lauan lumber	.....	.....	.....	203	86,072	12,538	.....	.....	.....	.....	.....	.....
Miscellaneous lumber	.....	.....	.....	.....	.....	.....	362	153,488	14,964	.....	.....	.....
Total	.....	.....	.....	297	125,928	18,538	362	153,488	14,964	.....	.....	.....
British East Indies:												
Miscellaneous timber	.....	.....	.....	7	2,968	720	2	848	300	.....	.....	.....
Tangile lumber	2	848	173	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous lumber	24	10,176	2,296	13	5,512	1,711	.....	.....	.....	.....	.....	.....
Total	26	11,024	2,469	20	8,480	2,431	2	848	300	.....	.....	.....
British Africa:												
Lauan lumber	.....	.....	.....	46	19,504	3,000	.....	.....	.....	.....	.....	.....
Singapore:												
Lauan lumber	43	18,232	2,827	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands:												
Tangile lumber	1	424	102	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lauan lumber	7	2,968	161	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	8	3,392	263	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands Indies:												
Miscellaneous lumber	.....	.....	.....	.....	.....	.....	4	1,696	126	.....	.....	.....
Guam:												
Tangile lumber	6	2,544	400	.....	.....	.....	.....	.....	.....	9	3,816	680
Lauan lumber	.....	.....	.....	10	4,240	1,000	.....	.....	.....	.....	.....	.....
Miscellaneous lumber	26	11,024	864	.....	.....	.....	.....	.....	.....	143	60,632	6,876
Total	32	13,568	1,264	10	4,240	1,000	.....	.....	.....	152	64,448	7,556
Hawaii:												
Lauan lumber	3	1,272	50	.....	.....	.....	.....	.....	.....	.....	.....	.....

Lumber and timber exported from the Philippine Islands—Continued.

Species.	1921			1920			1919			1918		
	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd feet.	Value.
Spain:												
Narra lumber				1	424	₱550						
Miscellaneous lumber						415						
Total				1	424	965						
All Countries:												
Narra timber	106	44,944	₱6,450	1	424	150	3	1,272	₱360			
Tangile timber										31	13,144	₱1,015
Miscellaneous timber	18	7,632	1,141	77	32,648	6,088	387	164,088	13,244	168	71,232	10,815
Total timber	124	52,576	7,591	78	33,072	6,238	390	165,360	13,604	199	84,376	11,830
Narra lumber	5	2,120	462	2	848	753			150	11	4,664	1,195
Tangile lumber	2,270	962,480	188,803	7,809	3,311,016	630,167	4,077	1,728,648	280,274	3,296	1,397,504	231,873
Almon lumber	5,804	2,460,896	313,058	3,176	1,346,624	177,598	905	383,720	37,316	3,759	1,593,816	79,250
Lauan lumber	15,201	6,445,224	862,072	18,322	7,768,528	832,957						
Miscellaneous lumber	4,403	1,866,872	202,678	3,307	1,402,168	186,584	10,697	4,535,528	474,083	9,434	4,000,016	326,648
Total lumber	27,683	11,737,592	1,567,073	32,616	13,829,184	1,828,059	15,679	6,647,896	791,823	16,500	6,996,000	638,966
Grand total	27,807	11,790,168	1,574,664	32,694	13,862,256	1,834,297	16,069	6,813,256	805,427	16,699	7,080,376	650,796

Lumber and timber imported into the Philippine Islands

Species.	1921			1920			1919			1918		
	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.
From United States:												
Ties	5,023	2,129,752	₱205,732							74	31,376	₱659
Cedar timber							389	164,936	₱5,924			
Miscellaneous timber	63	26,712	2,588	121	51,304	₱2,149	36	15,264	2,670	96	40,704	4,900
Pine lumber	1,043	442,232	56,864	2,545	1,079,080	110,172	4,612	1,955,488	247,345	6,235	2,643,640	202,008
Redwood lumber	1,123	476,152	89,568	851	360,824	55,185	871	369,304	30,833	1,294	548,656	37,210
Cedar lumber				270	114,480	11,164	37	15,688	2,355	499	211,576	7,223
Cedar box shooks			18,000									64,383
Miscellaneous lumber	12,979	5,503,096	374,679	9,687	4,107,288	451,662	6,657	2,822,568	242,285	4,088	1,733,312	117,084
Total	20,231	8,577,944	747,431	13,474	5,712,976	630,332	12,602	5,343,248	531,412	12,286	5,209,264	433,467

From Canada:												
Cedar timber	225	95,400	7,760									
Miscellaneous timber				69	29,256	1,743				7	2,968	680
Pine lumber				358	151,792	10,409						
Cedar lumber	164	69,536	3,588									
Miscellaneous lumber	3,676	1,558,624	100,749	3,231	1,369,944	82,147	1,062	450,288	43,719	742	314,608	16,357
Total	4,065	1,723,560	112,097	3,658	1,550,992	94,299	1,062	450,288	43,719	749	317,576	17,037
From Hongkong:												
Miscellaneous timber				6	2,544	237						
Cedar lumber				614	260,336	12,283						
Total				620	262,880	12,520						
From China:												
Miscellaneous timber	19	8,056	3,507	2	848	22	3	1,272	53	20	8,480	233
Miscellaneous lumber	424	179,776	17,174	142	60,208	4,044	29	12,296	510	50	21,200	724
Total	443	187,832	20,681	144	61,056	4,066	32	13,568	563	70	29,680	957
From Japan:												
Miscellaneous timber	8	2,592	75							25	10,600	985
Cedar box shooks												3,889
Pine lumber										17	7,208	608
Miscellaneous lumber	26	11,024	189			4	30	12,720	212	20	8,480	150
Total	34	13,616	264			4	30	12,720	212	62	26,288	5,632
From United Kingdom:												
Miscellaneous timber	7	2,968	146									
From Australia:												
Miscellaneous lumber	233	98,792	18,134									
From British East Indies:												
Miscellaneous timber	45	19,080	1,592	111	47,064	1,516	44	18,656	1,339			
Miscellaneous lumber	346	146,704	36,366	435	184,440	16,063	343	145,432	13,923	150	63,600	4,307
Total	391	165,784	37,958	546	231,504	17,579	387	164,088	15,362	150	63,600	4,307
From British West Indies:												
Miscellaneous timber										1,664	705,536	2,147
From French East Indies:												
Miscellaneous timber							3	1,272	96			
Miscellaneous lumber	116	49,184	832	13	5,512	32	7	2,968	239	26	11,024	752
Total	116	49,184	832	13	5,512	32	10	4,240	335	26	11,024	752

Lumber and timber imported into the Philippine Islands—Continued

Species.	1921			1920			1919			1918		
	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.	Cu. m.	Bd. feet.	Value.	Cu. m	Bd. feet.	Value.
From Spain:												
Cedar box shooks												₱1,738
Miscellaneous lumber				31	13,144	₱1,302						
Total				31	13,144	1,302						1,738
From Netherlands:												
Cedar box shooks						1,596						
From Netherlands East Indies:												
Cedar timber										50	21,200	1,137
From Germany:												
Miscellaneous timber										20	8,480	1,589
Pine lumber										2	848	15
Miscellaneous lumber							29	12,296	₱556			
Total							29	12,296	556	22	9,328	1,604
From Guam:												
Miscellaneous lumber				2	848	200						
From all countries:												
Ties	5,023	2,129,752	₱205,732							74	31,376	659
Cedar timber	225	95,400	7,760				389	164,936	5,924	75	31,800	2,122
Miscellaneous timber	142	59,408	7,908	309	131,016	5,667	86	36,464	4,158	1,807	766,168	9,549
Cedar lumber	164	69,536	3,588	884	374,816	23,447	37	15,688	2,355	499	211,576	7,223
Cedar box shooks			18,000			1,596						70,010
Pine lumber	1,043	442,232	56,864	2,903	1,230,872	120,581	4,612	1,955,488	247,345	6,254	2,651,696	202,631
Redwood lumber	1,123	476,152	89,568	851	360,824	55,185	871	369,304	30,833	1,294	548,656	37,210
Miscellaneous lumber	17,800	7,547,200	548,123	13,541	5,741,384	555,454	8,157	3,500,968	301,444	5,076	2,152,224	139,374
Total	25,520	10,819,680	937,543	18,488	7,838,912	761,930	14,152	6,000,448	592,059	15,005	6,393,496	468,119

It may be noted in the foregoing tables that the large volume of miscellaneous lumber coming from the United States and Canada is almost entirely Douglas fir and was recorded under miscellaneous instead of pine (Oregon pine) owing to the appearance of the name "fir" on the invoice recorded by the Bureau of Customs when Douglas fir is commonly known as Oregon pine in the Orient. This correction was not discovered until after the tables were made up.

The exports to the United States have decreased some 8,000 cubic meters during the year which may in a large measure be attributed to the falling off of the markets there but the indications are that the practice of a number of exporters of shipping lumber without reference to grade has had a detrimental effect on the market for Philippine lumber in the United States and that the continued delay in adopting standard rules by Philippine lumbermen with a force of competent graders to inspect every shipment before it is loaded on the steamers is causing a setback to the development of foreign trade in several countries which will bring greater trouble and expense to overcome in the future.

During the year the Philippine Lumbermen's Association was reorganized with one of its purposes of organization expressly stated to be the establishment of standard grading rules but as yet no appreciable steps have been taken by them to put such rules and a regular grading practice in force.

UTILIZATION SECTION AND WORKING COLLECTION

The section lost one valuable man through the retirement of Mr. E. E. Schneider, wood expert, in charge of the section. Mr. Schneider is a man of wide experience and has been in charge of the section since its formation. He has rendered valuable service to the Bureau and to the lumber industry as a whole. Upon his retirement the section remained unfilled until the arrival, in August, of the Bureau's pensionado to the United States who took specialized work in wood-technology and utilization.

There were a number of new projects taken up during the year. Among these are experiments in wood preservation which are being conducted in coöperation with the Atlantic Gulf and Pacific Company. In these preliminary treatments by pressure processes, it was found for the first time that apitong (*Dipterocarpus* sp.), the most abundant structural timber of the Islands, lends itself easily to impregnation, more so than the lauans, due to the comparative absence of thyloses in the pores. Several thousands of paving blocks and railroad ties were treated and as

much as 17 pounds absorption per cubic foot, has been obtained. The blocks and railroad ties are now being tested for durability by the City of Manila and various railroad companies and sugar centrals.

One of the drawbacks in the use of molave, ipil, and other naturally durable woods is the prohibitive cost which amounts to about 45 centavos for each block of 3″ x 8″ x 5″ in size. Another objection is that molave and other first group woods, when used for paving blocks, are too hard and during the rainy season, the paved streets become so slippery that they have to be covered with sand to prevent the horses, etc., from sliding. This, as will be seen, not only endangers the lives of horses and men, but it also increases the cost of maintenance. Apitong, on the other hand, while not as durable as molave, incorporates those properties which are desirable in paving blocks; namely, moderate hardness, strength, and susceptibility to treatment. It might be added in this connection that the common species used in the United States, where traffic is much greater than in this country, is Douglas fir (Oregon pine), the strength values of which are much lower than apitong, being only equivalent to our white lauans. Furthermore, the blocks are smaller being only three to four inches high as compared with five inches ordinarily used in this country. The cost of treatment cannot, as yet, be given as the tests were made on a small scale; however, an idea may be obtained on available data of treating plants in the United States where the cost of treating a square yard of four inch blocks amounts to ₱1.10, assuming the cost of oil injected into the wood to be two centavos per pound and 16 pounds per cubic foot. The treatment of structural timber which is generally injected with 10 pounds per cubic foot cost about ₱20 per 1,000 board feet and for each additional pound of creosote, about ₱2 is added when the oil is at 14 centavos per gallon.

The use of creosoted paving blocks is almost universally adopted in all modern cities the world over. Coal tar creosote is a strong antiseptic and as large quantities of it are injected into the wood, it follows that its presence alone tends to keep the streets in a healthful and sanitary condition. Creosoted paving blocks are durable; they are superior to molave in durability once treated and it wears slowly amounting to about $\frac{1}{32}$ of an inch on soft wood blocks a year. Streets are easily repaired and the surface can always be kept smooth at a very low cost. They are noiseless and, for this reason, are desirable in congested business districts.

As a result of these preliminary tests which are now being made on a semi-commercial scale, the above-mentioned company is seriously considering the establishment of a large treating plant for preserving native woods. This will redound in the greater utilization of apitong and other treatable woods as structural timber, because one of the drawbacks in the use of these woods is due, not to the lack of mechanical strength but rather, to their lack of lasting qualities.

The section also obtained valuable data on the microscopy of Philippine woods. These were incorporated in the researches of Forester Luis J. Reyes, formerly assistant wood-expert of the Bureau, performed in the United States while he was taking the higher course in forestry. The work, a microscopy of the woods of Philippine dipterocarps, is a detailed study of the woody structure and is useful in identifying closely related species of the family. There are now in preparation permanent mounts of the most important Philippine woods. There is a conspicuous absence of data on the anatomy of Philippine woods and the sections which are being prepared will furnish material for study. It might be stated that if the native woods are to be utilized intelligently, a thorough knowledge of their structure, etc., is essential.

Another work which was taken up during the year was a detailed study of the shaft industry. This industry employs crude methods of bending woods for shafts, thus breakage is unusually large amounting to about 25 per cent. This breakage can be easily lowered to about 5 per cent. One of the assistants in this section was detailed to make a thorough study of the shaft industry with a view of introducing modern methods of bending wood. Experiments are now being planned to determine the bending qualities of native woods. Data along this line are valuable for a possible bent-wood furniture industry similar to that of Vienna. There seems to be no reason why the Philippines with unlimited supply of wood of different mechanical properties cannot produce as good furniture as the Vienna products.

The section has coöperated with other Government offices, lumber companies, and other wood users in instituting proper methods of utilizing and handling lumber; likewise, with the City high schools in furnishing information and material such as wood and botanical specimens for study in biology. No less than 400 students visited the section for information regarding woods and minor forest products.

During the latter part of the year, one of the rangers stationed in the section was detailed to investigate the moisture content of green woods. There has never been heretofore any continued study made along this line and in two months field work there were accumulated much valuable data. This work confirmed the former belief that some of our woods such as pahutan (*Mangifera altissima*) and baniti (*Madhuca ramiflora*) contain over 100 per cent water based on their dry weights. While the ranger was engaged in this work, he was also detailed to make intensive collections of insects and fungi destructive to forest products. Very little attention has been paid to this study. The loss caused by insects and fungi to the softer dipterocarps alone amounts to hundreds of thousand pesos, but adequate measures of control other than proper brush disposal cannot be intelligently promulgated on account of lack of knowledge of the life history and the biology of these destructive agents.

There has already been assembled some 15 species of termites and about 25 species of fungi, together with notes on their habits, destructiveness, etc. The study of controlling termite destruction is now being investigated in coöperation with the zoölogy and chemistry departments of the University of the Philippines. The investigation consists of a thorough study of the habits of destructive termites by the zoölogist; the study of chemicals and methods of treatment by the chemists; and the study of structure and durability of woods in relation to termite resistance by the wood technologist.

BOTANICAL COLLECTIONS

There have been received during the year 458 botanical specimens, 134 of which were collected with wood specimens. Numerous trade samples have been collected but only 179 were retained as the others are already represented in the collection.

Among the most notable additions to the collection are ample materials of "Manggasalakag" (*Hydnocarpus hutchinsonii*) the seeds of which contain chaulmoogra oil which is a specific cure for leprosy. The seeds which were received in large quantity were distributed to the Bureaus of Agriculture and Science for propagation and analysis, respectively. There has been considerable difficulty in locating this species on account of the fact that it is little known even to the Moros. Forest officers stationed in Mindanao, especially in Basilan, have located numerous trees which are now being protected.

As a result of the request on the field force to collect logs and planks in order to replace those lost in the fire of 1920 Carnival, 32 logs and 35 planks have been received during the last two months of the year. The log specimens of guijo, batikuling, arangga, palosapis, and narra are valuable additions to the collection as these are either not previously represented or are exceptionally of large dimensions.

Thirty-five new planks have been added to the collection. One ten-foot plank of red narra, 54 inches (137 cm.) in width, is probably the largest specimen that has ever been brought to the market. No less notable is a plank of yakal, 53 inches (135 cm.) in width which is being loaned to the Bureau by the Mindanao Lumber Company. Two hundred and fifty-five wood specimens from eight different countries were received during the year, making the total number of foreign accessions 2,359.

There were distributed a total of 13,189 handspecimens during the year. Out of this number, 1,477 were sold, 4,946 furnished to Forest School, 2,381 distributed to different forest stations, and 4,385 distributed gratis. Besides these, 96 panels, mostly $\frac{3}{4}'' \times 6'' \times 12''$ in size, were sold to different concerns.

IDENTIFICATION, GRADING, AND INSPECTION

The number of specimens submitted by lumbermen, forest officers and others dealing in wood run to several hundreds. Aside from these, the section goes over all timber invoices made during the year. This work was found necessary in view of the fact that many invoices submitted to municipal treasurers and other deputies of the provincial treasurer contain misclassified species. In this connection it was found that one of the best means to minimize misclassification which results in loss of revenue to the Government, is to compile a sort of dictionary of local names giving their equivalent official names. This was made from available data and is now ready for the press.

There were submitted from Sumatra, 87 specimens for identification. Practically all of these were determined to the genus and a few to the species. This work of determining wood samples from abroad is made possible on account of extensive collection of foreign material which is now systematically arranged in the Utilization Section.

There have been numerous requests by local lumbermen to certify the identity of samples which they submit to their dealers abroad. The samples were sent to various European countries, United States, China, and Japan.

The amount of timber inspected and measured during the year is as follows:

	Board feet.
Logs	371,135
Piles	137,994
Lumber	176,998
Total	686,127

These figures do not include shipments of timber of which indentification only is wanted.

CARPENTRY SHOP

The small shop which the Bureau maintains, prepares logs, planks, and other specimens for the Wood Technologist's Office and Museum. It serves as a laboratory for the section because, in working the planks and log specimens, a correct knowledge of their working and finishing qualities is gained.

The work of rearranging the forest products showroom was entirely done by the carpenters of the Bureau. During the year the shop made 14 tables, 5 desks, 2 sections of library shelves, 113 panels, 22 floor specimens, 3,198 hand specimens, 10 sections of stand for logs and planks, and numerous other small jobs.

DIVISION OF FOREST LANDS AND MAPS

Because of recent legislation regarding public land and the amended procedure resulting from it, the Division of Forest Lands and Maps is in a transition stage. A number of problems must be solved and the only solution in some cases is legislation to give the Director of Forestry less cumbersome means of protecting the forests from unlawful claimants. Other problems have arisen in administrative details which must be settled. Each of these problems will be discussed during the course of the report.

PUBLIC FOREST LANDS CASES

There had been no definite arrangement whereby provincial fiscals were to confer with forest officers before dismissing cases for insufficient evidence to secure a conviction or for other reasons. At the request of the Bureau of Forestry, the Attorney-General on August 23, 1921 issued Circular No. 366, to wit:

TO ALL PROVINCIAL FISCALS:

For your information and guidance there is quoted hereunder a letter of the Director of Forestry dated August 12, 1921:

"SIR: In order to avoid complaints presented by Forest Officers to Provincial Fiscals being dismissed by the latter, because of the lack of

exact knowledge of the facts involved in the case or because of the lack of mutual understanding between the two officials, I have the honor to request, in cases of violations of the Forest Laws as well as opposition of the Government on behalf of the Director of Forestry against the registration of parcels of public forest land, that the Provincial Fiscals be instructed to communicate or confer with the Forest Officer who detected the violators or who furnished the necessary evidence in support of the Government with a view of discussing the matter thoroughly before dismissing the complaints or withdrawing the opposition of the Government. Also, it is requested that in case the opposition of the Government is withdrawn or a decision is handed down by the Court, the Provincial Fiscal should notify the Director of Forestry to that effect with the least possible delay in order to complete the record of the case in the Bureau of Forestry.

"Very respectfully,

"(Sgd.) ARTHUR F. FISCHER,
"Director of Forestry."

It is requested that the letter above quoted be strictly complied with.

PEDRO TUASON,
Acting Attorney-General.

Great benefit has been derived from this circular because forest officers have been instructed by these conferences with the fiscals and have obtained a better idea as to what constitutes evidence.

The large and unexpected increase in the number of cadastral cases has brought up another problem which has been solved. There was so little time between the date set for the trial of a case and the date upon which notice of the trial was received that forest officers were obliged to enter opposition to the registration of tracts of land, then make the necessary inspection and later withdraw their opposition. This procedure worked a hardship on the court, on the fiscal, and on the landowners. It does not seem possible to get notice of hearings in time to examine the land before the trial and therefore forest officers are being detailed to work with cadastral parties when these are working in forested regions. In other cases maps are obtained from the Bureau of Lands and, if any opposition is to be made, detailed maps are requested.

The following table shows the status and number of cases received and pending during the year 1921:

	Cadastral.			Ordinary.			Total.		
	Cases.	Lots.	Area in ha.	Cases.	Lots.	Area in ha.	Cases.	Lots.[a]	Area in ha.
Pending in 1920	1	365	9,683.1016	24	48	4,468.1019	25	413	14,151.2035
Received in 1921	39	35,790	109,820.6670	894	3,804	41,901.4223	933	39,594	151,722.0893
Total number of cases handled in 1921	40	36,155	119,503.7686	918	3,852	46,369.5242	958	40,007	165,873.2928
Number of cases action unnecessary	21	18,279	27,824.3755	849	3,723	35,082.9243	870	22,002	62,907.2998
Cases acted upon in 1921	19	17,876	91,679.3931	69	129	11,286.5999	88	18,005	102,965.9930
Cases opposition withdrawn after inspection	3	4,292	8,102.5567	32	59	3,523.7572	35	4,351	11,626.3139
Cases in Court	16	13,584	83,576.8364	37	70	7,762.8427	53	13,654	91,339.6791
Cases lost	.....	.....	.....	3	3	2,187.9855	6	11	2,187.9855
Cases won[b]	.....	.....	.....	3	8	11			
Cases pending on January 1st., 1922	16	13,584	83,576.8364	31	59	5,574.8572	47	13,643	89,151.6936

[a] It should be understood that only a part of the area in these lots is forested.

[b] In the three cases won the area of the lots was 2,187 hectares and the area of forest excluded as public forest lands, or as rights-of-way was 256 hectares.

PRIVATE FOREST LANDS REGISTRY

Thirty-seven certificates of forest registration covering 53 parcels of land with a total area of 11,552 hectares, 48 ares and 87 centares have been issued in accordance with the provisions of Section 1829 of the Administrative Code, of which 3,537 hectares, 53 ares and 93 centares are highland forests, 44 hectares, 24 ares and 42 centares mangrove swamps, and 7,970 hectares, 70 ares and 52 centares cultivated and open land.

Claimants of public forest land, who have no right to the land except their assertions and occupancy together with tax receipts, are causing considerable trouble in the administration of the public forests. To these another difficulty has been added, namely, conflicting interpretations of Sections 1513 and 1829 of the Administrative Code.

SEC. 1513. *Charges collectible for wood cut from unregistered private lands.*—The charges above prescribed shall be collected for all wood cut upon any land the title to which is not registered with the Director of Forestry as required by the Forest Law; and in the absence of such registration wood cut and removed from alleged private lands shall be considered as cut and reserved under license from public forests or forest reserves, and shall be subject to the law and regulations in such case applicable.

SEC. 1820. *Words and phrases defined.*—For the purposes of this chapter, "public forest" includes, except as otherwise specially indicated, all unreserved public land, including nipa and mangrove swamps, and all forest reserves of whatever character.

"Forest product," as used in this chapter and in the Internal Revenue Law, includes timber, firewood, barks, tree-tops, resins, gums, wood-oils, beeswax, nipa, rattans, or other forest growth and also stone or earth when taken elsewhere in a forest than from a mining claim.

SEC. 1829. *Registration of title of private forest land.*—Every private owner of forest land shall register his title to the same with the Director of Forestry. A list of such owners, with a statement of the boundaries of their property, shall be furnished by said Director to the Collector of Internal Revenue, and the same shall be supplemented from time to time as occasion may require.

Upon application of the Director of Forestry, the fiscal of the province in which any such land lies shall render assistance in the examination of the title thereof with a view to its registration in the Bureau of Forestry.

A careful study of previous legislation which these sections superseded shows that the purpose of the law was to prevent the fraudulent invoicing of timber. The registration of privately owned forests in the Bureau of Forestry is of distinct benefit to the owner as he is protected in his rights and is enabled to invoice and ship his timber without paying forest charges.

The ambiguity of Section 1513 in referring to any tract of land, the definition given by Section 1820 *for the purposes of the Forest Law* to "public forest" and the general use of the words "forest" (Bosques) and "forest land" (Terrenos Forestales), have been causing such confusion that this Bureau is exerting all its efforts with a view to securing definite and clear legislation on this matter.

The following table shows the private woodlands registered up to December 31, 1921:

Registered private woodlands

Calendar year.	Number of—			
	Parcels.	Hectares.	Ares.	Centares.
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,215	86	62
1910	4	8,653	85	22
1911	5	5,533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
1917	48	7,985	68	39
1918	84	43,213	17	26
1919	110	14,943	71	39
1920	41	47,723	82	90
1921	53	11,552	48	87
Total	1,194	440,027	15	75

LAND CLASSIFICATION

Because of the limited personnel and funds both in the Bureau of Lands and in the Bureau of Forestry, it was not practicable in former years to take up land classification on a large scale. However, with the passage of the new land law, it was decided that a radical change must be made. The experience of fifteen years had demonstrated that the inspection of each parcel of land as applied for by settlers was a cumbersome method involving much travel and duplication of work because often two to six applications were filed for the same parcel. This method caused much litigation among rival claimants because no legal boundaries were established.

The Bureau of Forestry therefore withdrew experienced rangers from other work and organized land classification parties. These men were instructed to locate the limits of agricultural land that could be declared open to settlers. Land covered with forests or that was too steep or rocky to plow even though

treeless was declared a forest zone for the time being. When the forests have been cut off by timber licensees the land suitable for agriculture can be eliminated from the forest zone. Trees at the corners of the forest zone were blazed and also those on streams or where trails entered the forest in order that the general public might recognize the boundary between forest and agricultural land.

If the Bureau of Lands is able to follow up promptly the classification with a survey of the land then the above procedure is satisfactory. Unfortunately, the Bureau of Lands has so many demands made upon it for surveyors and land surveys of all kinds that the forest zone boundaries may disappear before the survey is made, thus necessitating another examination of the land. To obviate this difficulty and to mark permanently the forest boundary, the Bureau of Forestry should be authorized to survey forest boundaries, place monuments, and then properly establish a forest reserve thus settling the status of the land and making it easier to deal with squatters.

Before going more fully into the subject of forest reserves, the subject of land classification will be finished.

It is expected that the committee appointed by the Honorable, the Secretary of Agriculture and Natural Resources for the purpose of securing greater efficiency, and economy in the coöperative work of the Bureaus of Lands and Forestry for the delimitation and disposition of public lands, will be able to find a method which, if put into practice, will tend to eliminate the actual conflicts between settlers and bring about the proper solution of the questions affecting the disposition and adjudication of public lands.

The most important question at present is to decide the final action to be taken in regard to the thousands of individual applications not yet certified by the Bureau of Forestry. The policy to be adopted will depend upon the available personnel and money.

The table in the appendix shows the distribution of individual applications in the different provinces of the Archipelago, the summary of which is as follows:

Applications on hand during 1921		5,282
Certified for agriculture	305	
Certified for forestry	27	
Returned uncertified	18	
		350
Total pending December 31, 1921		4,932

Table showing the regions under delimitation

Requested.		Regions.		Field work.		Certified on—
By—	Date.	Provinces.	Municipalities.	Begun—	Completed—	
Director of Lands	April 12, '20	Camarines Norte	Labo	May 7, '20	May 25, '20	July 3, '20
Proclamation No. 20	May 25, '20	Mindoro	Bongabon	May 9, '20	June 3, '20	Aug. 25, '20
Director of Lands	May 13, '20	Nueva Ecija	do	July 1, '20	July 16, '20	Aug. 24, '20
Proclamation No. 50	June 11, '20	Mindoro	Calapan	July 2, '20	Sept. 15, '20	Nov. 17, '20
		Camarines Sur	Tinambac and Calabanga.	Sept. 18, '20	Sept. 30, '20	Dec. 3, '20
		Sorsogon	Irosin	Nov. 17, '20	Nov. 25, '20	May 9, '21
			Capoocan	Oct. 5, '20	Nov. 20, '20	May 12, '21
Director of Lands	June 19, '20	Leyte	Alang-alang	Nov. 21, '20	Dec. 23, '20	May 4, '21
			Ormoc	Jan. 3, '21	Jan. 15, '21	June 23, '21
		Samar	Gandara and Borongan.	Oct. 22, '20	Jan. 11, '21	Aug. 11, '21
		Negros Occidental	Kabankalan	July 24, '21	Dec. 22, '21	Report in progress.
Proclamation No. 32	Aug. 27, '20	Lanao	Kolambugan	Nov. 12, '20	Nov. 13, '20	Nov. 19, '20
Director of Lands	Aug. 31, '20	Negros Occidental	San Carlos	Sept. 29, '20	Dec. 15, '20	July 7, '21
Proclamation No. 40		Nueva Ecija	Vaca	Nov. 16, '21	Nov. 27, '21	Pending certification.
Proclamation No. 51	Nov. 19, '20	Tayabas	Guinayangan	Dec. 17, '20	May 19, '21	Oct. 18, '21
			Calauag	do	do	Do.
Proclamation No. 61		Cotabato	Kiamba			
Proclamation No. 63		Mindoro	All			
Proclamation No. 64	April 30, '21	Nueva Vizcaya	All (part only finished).	May 26, '21	July 21, '21	Dec. 28, '21
Proclamation No. 65		Cagayan	All	April 2, '21	Sept. 13, '21	Report in progress.
Proclamation No. 66		Isabela	do	do	do	Do.
		Agusan	do			
		Bukidnon	do			
		Cotabato	do			
Proclamation No. 67		Davao	do			
		Lanao	do			
		Sulu	do			
		Zamboanga	do			
Resolution No. 50, Municipal Council	Aug. 8, '21	Tayabas	Baler	July 8, '21	Dec. 3, '21	Report in progress.

Forest Station Reserve.—The tract of land where the Forest Station of Port Banga, or barrio Bangaan, municipal District of Banga, Province of Zamboanga, is located, containing an area of 1,533 square meters, was set aside as a reserve on August 27, 1921, by Proclamation No. 28.

Mount Banahao Forest Reserve.—The tract of land comprising mounts Banahao and San Cristobal, having an area of 12,858 hectares, was set aside as a forest reserve on October 14, 1921, by Proclamation No. 42. This reservation was made for reforestation, conservation, and water protection purposes.

Mount Arayat Forest Reserve.—The tract of land comprising the Arayat Mountain, having an area of 4,642 hectares, was set aside as a reserve on October 14, 1921, by Proclamation No. 40. This reservation was made to prevent further violations of the forest regulations, to regulate as much as possible the utilization of forest products in order to insure their constant supply, and to carry out with success the reforestation work to be inaugurated by the Bureau.

Proposed Forest Reserve on the Talavera Watershed (for the protection of the Muñoz Irrigation Project).—The tract covered by this proposed reserve in the municipalities of Lupao, San Jose, Pantabangan, and Caranglan, Province of Nueva Ecija, has already been inspected by the personnel of this Bureau. It has an approximate area of 38,785 hectares.

In connection with the land classification, forest zones were established in the regions already classified in order to separate the lands that are retained by the Bureau of Forestry for forestry purposes.

The necessity of establishing forest reserves becomes apparent when it is realized that under the existing law on practicable way exists of evicting a squatter from a public forest or of preventing him from extending his holdings. In case he is convicted of destroying a forest he considers his receipt for the fine paid as evidence that he has a right to the land. In other cases, persons who apparently have no documents to prove their right to a forest, refuse to submit their evidence of title and also refuse to vacate the land. Legislative action is being considered which will facilitate the protection of forests from such claimants and will also safeguard legitimate private interests in the forests. However, the establishment of forest reserves (permanent forests for beneficial use) will gradually eliminate such claimants but the process is too slow unless more men, especially surveyors, will be available for the work.

COMMUNAL FORESTS

There have been established 95 new parcels with a total area of about 10,322.20 hectares as communal forests in 55 municipalities.

At present, the legal status of communal forests is practically the same as that of an area of public forest. They are set aside for the free use of forest products by a community. There is no other difference, as compared with a public forest granted to licensees, except that no forest charges are paid on the forest products removed.

This legal status of the communal forests makes the public believe them to be, like the public forests, subject to entry or settlement in those parts which are not covered with valuable trees.

The increasing number of conflicts which occur from time to time regarding cases of illegal destruction and occupation of lands within the communal forests and the lack of coöperation in their protection and conservation on the part of the majority of the municipal authorities, caused this Bureau to present a bill to the Legislature to the effect that communal forests be exempted from entry and occupation.

In the development plan of the Bureau of Forestry it is proposed to handle the communal forests in such a way that they will be used for social recreation, a field for silvicultural experiments, and for supplying the present and future forest necessities of the community, in order that the municipality will be independent for its supply of forest products in the future.

This work cannot be carried out with any probability of success as long as the communal forests are not considered practically the same as forest reserves set aside for local use.

The following tables show the total number of communal forests established up to December 31, 1921, and their distribution by provinces:

Communal forests established from 1908 to 1921

Year.	Parcels.	Hectares.
1908	19	5,326.00
1909	19	6,609.00
1910	19	5,796.00
1911	53	15,147.60
1912	59	10,957.00
1913	26	3,387.00
1914	45	6,860.00
1915	90	12,129.00
1916	110	15,862.00
1917	83	10,110.00
1918	61	7,704.82
1919	63	10,537.35
1920	69	9,008.85
1921	95	10,322.20
Total	811	129,776.82

Statement of communal forests established up to December, 1921

Provinces.	Parcels established.		Total parcels established up to 1921.	Municipalities, rancherias or townships.			Cancelled.	
	Before 1921.	During 1921.		With communal forests.	Without communal forests.	Area in hectares of parcels established up to 1921.	Parcels.	Hectares.
Abra	27	2	29	16	23	5,723.00	.....	.....
Albay-Catanduanes	16	7	23	12	11	2,105.00	.....	.....
Antique	4	1	5	5	8	1,070.00	.....	.....
Bataan	16	.....	16	12	.....	4,791.40	2	464.00
Batanes	.....	.....	.....	.....	6	.....	.....	.....
Batangas	2	.....	2	1	24	136.00	.....	.....
Bohol	33	5	38	25	11	4,660.80	.....	.....
Bulacan	2	.....	2	2	22	340.16	1	232.16
Cagayan	37	2	39	20	4	4,625.60	2	186.00
Camarines Norte	8	.....	8	7	2	1,171.00	.....	.....
Camarines Sur	34	9	43	25	6	4,702.90	1	175.00
Capiz	30	2	32	11	14	3,026.00	.....	.....
Cavite	.....	1	1	1	19	252.00	.....	.....
Cebu	10	2	12	9	42	1,288.80	.....	.....
Ilocos Norte	22	.....	22	15	15	7,269.00	4	1,127.00
Ilocos Sur	27	.....	27	23	35	9,503.00	.....	.....
Iloilo	14	.....	14	7	28	1,817.00	.....	.....
Isabela	19	.....	19	13	14	3,131.00	1	106.00
Laguna	13	3	16	11	17	2,252.00	.....	.....
La Union	15	1	16	19	14	4,820.00	.....	.....
Leyte	42	9	51	25	21	5,503.28	.....	.....
Mindoro	4	7	11	5	14	1,176.00	.....	.....
Misamis	21	.....	21	13	42	3,383.00	.....	.....
Mindanao and Sulu:								
Agusan	1	.....	1	1	57	160.00	.....	.....
Bukidnon	1	.....	1	1	11	620.00	.....	.....
Cotabato	.....	.....	.....	.....	32	.....	.....	.....
Davao	2	.....	2	1	22	164.00	.....	.....
Lanao	2	1	3	2	36	1,053.00	2	800.00
Sulu	.....	.....	.....	.....	29	.....	.....	.....
Zamboanga	4	.....	4	2	76	327.00	1	9.00
Mountain Province:								
Apayao	4	.....	4	1	6	606.00	.....	.....
Benguet	1	.....	1	1	11	100.00	.....	.....
Bontoc	.....	.....	.....	.....	18	.....	.....	.....
Ifugao	.....	.....	.....	.....	6	.....	.....	.....
Kalinga	.....	.....	.....	.....	13	.....	.....	.....
Nueva Ecija	27	2	29	23	35	5,867.00	1	195.00
Nueva Vizcaya	5	5	10	6	12	1,467.00	.....	.....
Occidental Negros	32	.....	32	14	11	3,633.00	1	240.00
Oriental Negros	16	.....	16	13	85	1,596.00	.....	.....
Palawan	.....	.....	.....	.....	16	.....	.....	.....
Pampanga	3	.....	3	3	18	395.00	.....	.....
Pangasinan	42	7	49	30	34	13,448.48	1	300.00
Rizal	6	8	14	7	20	1,400.40	1	76.00
Romblon	6	.....	6	4	5	485.00	.....	.....
Samar	51	8	59	33	12	8,903.00	.....	.....
Sorsogon-Masbate	21	8	29	16	8	2,554.00	.....	.....
Surigao	15	.....	15	8	23	2,384.00	.....	.....
Tarlac	10	1	11	8	8	1,894.00	1	265.00
Tayabas	44	1	45	21	7	4,569.00	1	126.00
Marinduque	10	.....	10	5	1	1,432.00	.....	.....
Zambales	17	3	20	13	.....	3,972.00	.....	.....
Total	716	95	811	490	1,004	129,776.82	20	4,301.16

Total number of parcels and hectares established from 1908 to 1921	811	129,776.82
Total number of parcels and hectares cancelled in various years	20	4,301.16
Balance in force	791	125,475.66

MAPPING AND DRAFTING

For the purpose of compiling an up-to-date forest map of the different regions in the Philippines, forest officers are required to take topographical notes and valuation surveys in addition to their numerous work relating to the administration of public forests. During the year 1921, the total of the trail notes taken

is 13,087.95 kilometers with 1,137.74 hectares of forest valuation distributed in the different districts as follows:

Number of kilometers of field notes and number of hectares of valuation surveys taken during 1921

District No.	Received.		Pending.		Total.	
	Kilometers.	*Hectares.*	*Kilometers.*	*Hectares.*	*Kilometers.*	*Hectares.*
1	315.99	2.50	5,194.45	249.21	5,510.44	251.71
2	147.66	8.50	56.62	0	204.28	8.50
3	122.25	8.00	59.97	0	182.22	8.00
4	805.90	118.23	375.19	4.40	1,181.09	122.63
5	491.22	129.85	536.78	38.61	1,028.00	168.46
6	725.79	88.93	283.02	9.00	1,008.81	97.93
7	301.65	77.48	898.57	14.50	1,200.22	91.94
8	378.75	41.94	192.47	40.50	571.22	82.48
9	114.27	0	6.00	0	120.27	0
10	257.43	42.90	210.46	36.68	467.89	79.58
11	168.50	43.62	47.48	11.75	215.98	55.37
12	99.72	29.58	21.50	4.60	121.22	34.18
13	505.05	29.90	771.26	107.06	1,276.31	136.96
Total	4,434.18	621.43	8,653.77	516.31	13,087.95	1,137.74

In order to unify the compilation of all topographical and forest data which are gathered from different sources, the Philippine Archipelago is divided into progressive forest sheets of 1° x 30′ for those compilations on the scale of 1:100,000 and 10′ x 10′ for those having a scale of 1:20,000. The scale of 1:100,000 is used for the general compilation of all the data and it serves as the basis for the preparation of the forest Atlas of the Philippines. The scale of 1:20,000 is used in the compilation of all data about concessions, communal forests, studies for exploitation, and in all cases when the showing of details or graphical information is necessary. From these sheets other maps are traced or prepared.

	Sheets.
Progressive forest maps:	
Scale 1:100,000—1° × 30′ = 45 inches × 25 inches	162
On drawing paper:	
Pending preparation on December 31, 1920	34
Prepared during 1921	5
Pending preparation	29
On tracing cloth:	
Pending on December 31, 1921	110
Scale 1:20,000—10′ × 10′ = 38 inches × 38 inches	1,481
Pending December 31, 1921	1,451
Special maps:	
Communal forest:	
Pending on December 31, 1920	11
Received during 1921	95
Total	106
Completed during 1921	89
Pending on December 31, 1921	17

Special maps—Continued.

Land classification:	Sheets.
Received during 1921	11
Completed during 1921	9
Pending	2
Others completed during 1921:	
Forest reserves	4
Forest reconnaissance	1
Forest contract of leases or special permits	4
For opposition against the registration in the Court	156
Showing vegetation in color	19
Copies in blue and maduro prints for field force and official uses	3,377
Sold to different entities (₱133.47)	66
Miscellaneous	284

ADMINISTRATIVE DIVISION

GENERAL STATEMENT

The work of this Division involves the general supervision of all the clerical work of the Bureau, keeping of the efficiency and civil records of the employees and all general records, the preparation of estimates for the annual appropriation and distribution of same and its accounting, the care of the property, the control of the clerks in the provinces, the upkeep and maintenance of the office building, the supervision of the general section and the general administration of the Office including the preparation of routine correspondence and typing reports appertaining to other divisions.

This Division has a direct relation with the increase in technical and quasi-technical personnel and activities of this Bureau and due to the economy measure which has been strictly observed in this office, the personnel in the various sections under this Division has been overworked and the undersigned wishes to state in this connection that it is earnestly desired that as soon as it is possible, due recognition be given to the personnel of this Division as well as to all the clerks in this Bureau, in general, by increasisng its remuneration and number, as any increase in the activities of this Bureau has a direct bearing on its clerical force. The present salaries paid to the clerks in this Bureau do not offer much incentive for advancement and therefore clerks consider the work in the Bureau only as a stepping stone for transfer to other Bureaus of the Government.

This Division has under its control the following sections besides having direct supervision over all clerical work of the Bureau: Accounting, Property, Records, Library and Translating, General Service Sections, and District Clerks.

ACCOUNTING SECTION

This section has under its charge the auditing of all expense accounts of the personnel and all such accounts as are rendered by or against this Bureau as well as the preparation of all warrants in payment of salaries and all accounts with its employees and other parties.

Due to economy measure this section has been kept down to a minimum of personnel that its clerks are overburdened. If additional field personnel is allowed the coming year it is imperative that the necessary addition be allowed for clerks in this section.

PROPERTY SECTION

This section has under its charge the supervision of all property work and its distribution to different requisitioners in this Bureau. The requisitions of the Forest Stations and field force and the central office of this Bureau have been reduced to the minimum to carry on the routinary office and field work.

Foreseeing that the amount allotted for 1921, would not entirely cover the needs under this item, only supplies of absolute necessity were requisitioned during the year, but at the end of the year, this amount allotted for this item was exceeded. The excess was due to the fact that the graduates of the Forest School who were employed during the year had to be provided with office and field equipment. Additional money was requested in the estimates but not allowed in 1921 Budget, and in addition the Emergency Board reduced the amount allowed.

During the year, however, a quantity of equipment and supplies was transferred to this Bureau without cost, but before this could be used it had to be repaired and in instances it had caused delay. Property amounting to about ₱2,795.26 was dropped from the records of this office during the year through sale, loss, and condemnation. The adjustments have been sanctioned by the Insular Auditor.

The property clerk, who is the chief of this section also acts as the cashier and disbursing officer for the payment of salaries of the employees of the Manila Office and receives cash bond deposits required of all licensees of this Bureau. His average monthly collections amounted to ₱14,000 during the time of the renewal of all timber and minor forest product licenses. All such collections as are made by him on this account are deposited in the Insular Treasury every other day in compliance with existing regulations.

RECORD SECTION

Due to the low salary paid to the clerks of this Bureau as has been stated, only mediocre clerks could be obtained for this section, but the older and more experienced members of this section have tried their best to carry on the work and to take upon themselves the increased work which naturally results through the increase in the technical and quasi-technical force. In June of this year, the work of this section has been reorganized and some changes in personnel have taken place, and the handling of records has been divided among the more experienced clerks in this section in order to divide evenly the work and to properly safeguard the records of this Bureau.

The system in use in this section is similar to the system used in the United States Forest Service, designating the correspondence written by and received in this Bureau, and is briefed on cards which are arranged alphabetically according to their heading in order to readily locate any individual piece of correspondence.

LIBRARY AND TRANSLATING SECTION

All the books, periodicals, lumber journals and other magazine and publications received in this Bureau are under the charge of this section. Since the chief of this section also does the translation work of this Office, it is desired that a clerk be assigned to this section as his assistant as soon as possible.

GENERAL SERVICE SECTION

The chauffeur, messengers, janitors, and watchmen come under this section. While the work in this section has been carried on satisfactorily throughout the year, both in the messenger service and in the maintenance and upkeep of the building and yards of this Bureau, it is desired, however, that funds be made available for the appointment of additional messengers as their present number is by no means sufficient to answer the demand for messenger service of this office.

DISTRICT CLERKS

The difficulty of securing clerks for the district stations of this Bureau has continued during the year. The efforts exerted by this office to secure efficient clerks for its district stations have in many instances produced no results because of the low salary, which this Bureau is authorized to pay them. In some instances temporary clerks have been appointed and in other cases forest officers have been obliged to do the clerical work

of their station at a sacrifice of their field work. Until higher pay can be offered for these positions this condition will continue.

RECOMMENDATIONS

That the policy of permanent forest reserves be given greater impetus;

That the legislation affecting communal forests be changed to give them the status of forest reserves;

That forest legislation now in force be made clearer and delegating authority of enforcement on the Director of Forestry;

That at least six forest experiment stations be established throughout the Islands;

That a forest products laboratory be provided for the Division of Investigation;

That funds be made available for adequate reforestation of water sheds;

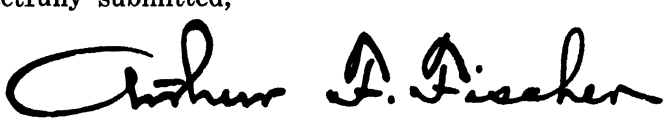
That the Government urge the necessity of higher technical training in forestry at the Forest School to the Board of Regents of the University;

That the salaries of the personnel of the Bureau be on the same plane as other technical bureaus;

That the personnel, particularly in the ranger group, be increased to adequately handle the work; and

That a permanent corps of forest guards on at least third grade Civil Service rating be allowed.

Respectfully submitted,



Director of Forestry.

The SECRETARY OF AGRICULTURE
AND NATURAL RESOURCES,
Manila.

DIRECTORY OF THE BUREAU OF FORESTRY

ARTHUR F. FISCHER, *Director*

DIVISION OF FOREST MANAGEMENT [1]

Ramon J. Alvarez ..... Forester, Acting Chief.
Apolinario Suyat ..... Forest supervisor
Agapito Cenabre ..... Forest supervisor.
Fausto Alambra ..... Ranger.
Petronilo Cortes ..... Ranger.
Jose G. Pacis ..... Ranger.
Gregorio Elumir ..... Ranger.
Jose Angeles ..... Junior stenographer.

SPECIAL PERMIT SECTION

Eladio C. Leaño ..... Forest supervisor, Chief.
Alejandro de Mesa ..... Ranger.
Fausto Pe Benito ..... Clerk.

LICENSE SECTION

Eufemio Santillan ..... Chief.
Enrique Baña ..... Clerk.
Luis S. Mabagos ..... Clerk.
Avelino Rivera ..... Clerk.
Anselmo Racpan ..... Clerk.
Agustin Guzman ..... Clerk.
Francisco de Asis ..... Clerk.
Melanio Espiritu ..... Clerk.
Manuel Bollozos ..... Clerk.
Claro L. Camba ..... Clerk.
Laureano de la Peña ..... Clerk.
Eduardo Rosete ..... Clerk.

DISTRICT NO. 1

[Provinces: Cagayan, Isabela, Mountain Province, (Apayao and Kalinga, Sub-provinces of), and Batanes]

Forest Station at Aparri, Cagayan (district headquarters):
Pastor de la Peña ..... Officer in charge.
Angel Salazar ..... Ranger.
Felipe Pattugalan ..... Clerk.
Forest Station at Ilagan, Isabela:
Mamerto Azurin ..... Officer in charge.
Forest Station at Alcala, Cagayan:
Deogracias Guzman ..... Officer in charge.
Francisco Siriban ..... Ranger.
Forest Station at Echague, Isabela:
Vicente Velasco ..... Officer in charge.
Forest Station at Claveria, Cagayan:
Luis Aguilar ..... Officer in charge.

[1] All scalers under this division also belong to the Division of Sawmills and Utilization.

DISTRICT NO. 2

[Provinces: Ilocos Norte, Ilocos Sur, and Abra]

Forest station at Vigan, Ilocos Sur (district headquarters):
Espiritu Paraiso ..... Officer in charge.
Bangued, Abra:
Cayetano Barros ..... Officer in charge.
Juan Balbuena ..... Forest guard.

DISTRICT NO. 3

[Provinces: Mountain Province (Benguet, Bontoc, Amburayan, and Lepanto), and La Union (northern part)]

Forest Station at Baguio, Mountain Province (district headquarters):
Mauricio J. Oteyza ..... District forester.
Vicente J. Defensor ..... Ranger.
Edilberto Madrid ..... Ranger.
Jose Medina ..... Ranger.
Pastor Garcia ..... Forest guard.
Esteban Fontanilla ..... Forest guard.
Pedro Gacad ..... Forest guard.
Aquilino Balbin ..... Forest guard.
Timoteo Lagasca ..... Forest guard.
Luis Chigas ..... Forest guard.

DISTRICT NO 4

[Provinces: Pangasinan, Nueva Ecija, Nueva Vizcaya, Tarlac, and La Union (southern part)]

Forest Station at Dagupan, Pangasinan (district headquarters):
Benigno Alejandro ..... Officer in charge.
Juan Acenas ..... Ranger.
Irineo Lopez ..... Clerk.
Canuto Ducusin ..... Forest guard.
Forest Station at San Quintin, Pangasinan:
Amando Curaming ..... Officer in charge.
Victoriano Mariano ..... Forest guard.
Anselmo Agustin ..... Forest guard.
Forest Station at Bayombong, Nueva Vizcaya:
Pedro Afalla ..... Officer in charge.

DISTRICT NO. 5

[Provinces: Batangas, Tayabas, Laguna, and Marinduque]

Forest Station at Los Baños, Laguna:
Theodore C. Zschokke ..... District forester.
Severo Oliveros ..... Ranger.
Mamerto D. Sulit ..... Ranger.
Ildefonso C. Ferrer ..... Forest guard.
Cirilo Cabauatan ..... Forest guard.
Isabelo H. Alviar ..... Forest guard.
Forest Station at Calauag, Tayabas:
Braulio Cristobal ..... Officer in charge.
Felix Dayao ..... Forest guard.
Albino Labaco ..... Forest guard.
Forest Station at Infanta, Tayabas:
Mauro S. Baculi ..... Officer in charge.

Forest Station at Laguimanoc, Tayabas:
- Pedro P. Lasquety ..... Officer in charge.
- Victor Gaboco ..... Forest guard.
- Eusebio Villanueva ..... Forest guard.

Forest Station at Mauban, Tayabas:
- Norberto Soloria ..... Officer in charge.
- Angel A. Sarmiento ..... Forest guard.

Forest Station at Kabibihan, Tayabas:
- Gregorio Arizabal ..... Officer in charge.
- Castor Jundak ..... Forest guard.
- Cayetano Gamalinda ..... Forest guard.

DISTRICT No. 6

[Provinces: Albay, Camarines Sur, Camarines Norte, Catanduanes, and Sorsogon]

Forest Station at Naga, Camarines Sur (district headquarters):
- Macario A. Mariano ..... Officer in charge.
- Gregorio J. Labitag ..... Ranger.
- Inocencio Ramirez ..... Ranger.
- Gregorio Miras ..... Ranger.
- Fermin Sol ..... Forest guard.
- Eulogio Gines ..... Forest guard.

Forest Station at Mercedes, Camarines Norte:
- Jesus O. Duran ..... Officer in charge.
- Pedro Magistrado ..... Forest guard.

Forest Station at Sorsogon, Sorsogon:
- Numeriano Valencia ..... Officer in charge.
- Alejandro Eguarras ..... Forest guard.

Forest Station at Catabangan, Tayabas:
- Macario Simeon ..... Officer in charge.
- Pedro Silvestre ..... Forest guard.
- Vedasto Rafa ..... Forest guard.

Forest Station at Virac, Albay:
- Felix Mabbayag ..... Officer in charge.
- Agapito M. Borja ..... Forest guard.

Forest Station at Legaspi, Albay:
- Filemon Kapuno ..... Officer in charge.
- Hermenegildo Bautista ..... Ranger.

DISTRICT No. 7

[Provinces: Antique, Capiz, Iloilo, Negros Occidental, and Romblon]

Forest Station at Iloilo, Iloilo (district headquarters):
- Jose B. Hirro ..... Officer in charge.
- Jose B. Logan ..... Ranger.
- Maximino Rondario ..... Ranger.
- Pedro Valentin ..... Ranger.
- Manuel Tupas ..... Ranger.
- Gavino Jarantilla ..... Forest guard.

Forest Station at Cadiz, Negros Occidental:
- Roman Amor ..... Officer in charge.
- Gregorio Poblacion ..... Ranger.
- Teodoro Oliveros ..... Forest guard.
- Leon de los Reyes ..... Forest guard.
- Mansueto Olaira ..... Forest guard.

Forest Station at San Carlos, Negros Occidental:
Melecio Lopez ..... Officer in charge.
Fausto Ejercito ..... Forest guard.
Forest Station at Ilog, Negros Occidental:
Vicente Villaflor ..... Officer in charge.
Inocencio Debuyan ..... Forest guard.
Julian Catipay ..... Forest guard.
Forest Station at Fabrica, Negros Occidental:
Juan S. Versoza ..... Officer in charge.
Pedro Montero ..... Ranger.
Ruperto Yzarri ..... Forest guard.
Francisco Diaz ..... Forest guard.
Severino E. Lovero ..... Forest guard.
Ambrosio Canilao ..... Forest guard.
Forest Station at New Washington, Capiz:
Probo Villanueva ..... Officer in charge.
Epifanio Biñas ..... Forest guard.

DISTRICT No. 8

[Provinces: Zamboanga (except northern part), Sulu, Cotabato, and Davao]

Forest Station at Zamboanga, Zamboanga (district headquarters):
Porfirio San Buenaventura ..... Acting district forester.
Florencio Asiddao ..... Ranger.
Celestino Gomez ..... Ranger.
Sixto Babao ..... Ranger.
Pedro Aguilar ..... Forest guard.
Forest Station at Cotabato, Cotabato:
Jose Flores ..... Officer in charge.
Cayetano Macaraeg ..... Ranger.
Forest Station at Isabela de Basilan, Zamboanga:
Teodoro Tecson ..... Officer in charge.
Isabelo V. Ostrea ..... Forest guard.
Forest Station at Naga-Naga, Zamboanga:
Enrique Alviar ..... Officer in charge.
Gregorio L. Dagang ..... Ranger.
Jose Makil ..... Ranger.
Nicolas O. Luna ..... Forest guard.
Forest Station at Port Banga, Zamboanga:
Santiago Babaran ..... Officer in charge.
Forest Station at Davao, Davao:
Simplicio Aguilar ..... Officer in charge.
Ramon Mataya ..... Ranger.
Lorenzo Logan ..... Ranger.
Forest Station at Mati, Davao:
Juan C. Andrada ..... Officer in charge.
Forest Station at Jolo, Sulu:
Juan Corales ..... Officer in charge.
Forest Station at Margosatubig, Zamboanga:
Juan Daproza ..... Officer in charge.
Bonifacio Perez ..... Ranger.
Manuel San Luis ..... Forest guard.

DISTRICT No. 9

[Province: Palawan]

Forest Station at Puerto Princesa, Palawan (district headquarters):
Miguel Pato ..... Officer in charge.
Benito L. Roque ..... Ranger.
Forest Station at Balabac, Palawan:
Mauro Iblaza ..... Officer in charge.

DISTRICT No. 10

[Provinces: Leyte (eastern half), Samar, Surigao, and Masbate]

Forest Station at Tacloban, Leyte (district headquarters):
Adriano V. Santos ..... Officer in charge.
Leon Rojas ..... Ranger.
Agustin P. Angeles ..... Ranger.
Florentino L. Nerviol ..... Forest guard.
Jose Sydiongco ..... Forest guard.
Tereso Malate ..... Forest guard.
Forest Station at Catbalogan, Samar:
Ramon A. Acuña ..... Officer in charge.
Forest Station at Laoang, Samar:
Emeterio Edmilao ..... Officer in charge.
Forest Station at Masbate, Masbate:
Atanasio Catambay ..... Officer in charge.
Florentino Verzoza ..... Ranger.
Forest Station at Surigao, Surigao:
Perfecto Tomeldan ..... Officer in charge.
Simon Montero ..... Ranger.

DISTRICT No. 11

[Provinces: Cavite, Rizal, Pampanga, Bataan, Bulacan, and Zambales]

Forest Station at Manila (district headquarters):
Clemente Mariano ..... Officer in charge.
Vicente Zosa ..... Ranger.
Eugenio Mendoza ..... Clerk.
Teodoro Magalindan ..... Forest guard.
Forest Station at Arayat, Pampanga:
Ambrosio Galisim ..... Officer in charge.
Forest Station at Orani, Bataan:
Pedro Gangan ..... Officer in charge.
Victorio Alquiroz ..... Forest guard.
Arcadio Nava ..... Forest guard.
Forest Station at Limay, Bataan:
Tomas N. Roque ..... Officer in charge.
Florencio M. Songco ..... Ranger.
Felix Bawan ..... Ranger.
Primitivo Baluyot ..... Forest guard.
Deogracias F. Agustin ..... Forest guard.
Emilio Fabila ..... Forest guard.
Forest Station at Moron, Bataan:
Fernando L. Amarillas ..... Officer in charge.

Forest Station at Norzagaray, Bulacan:
Andres Bernardo ..... Officer in charge.
Forest Station at Masinloc, Zambales:
Valentin Sajor ..... Officer in charge.
Valeriano V. Elgincolin ..... Forest guard.

DISTRICT No. 12

[Province: Mindoro]

Forest Station at Calapan, Mindoro (district headquarters):
Cornelio Nable Jose ..... Officer in charge.
Aniano David ..... Ranger.
Eusebio Leuterio ..... Ranger.
Forest Station at San Jose, Mindoro:
Leoncio Rebong ..... Officer in charge.

DISTRICT No. 13

[Provinces: Cebu, Negros Oriental, Misamis, Bukidnon, Lanao, Agusan, Leyte (western half) and Bohol]

Forest Station at Cebu, Cebu (district headquarters):
Isabelo Achacoso ..... Officer in charge.
Silvino Reyes ..... Ranger.
Leonor Lizardo ..... Ranger.
Daniel B. Allas ..... Ranger.
Victoriano Caratao ..... Forest guard.
Forest Station at Dumaguete, Negros Oriental:
Alberto Villanueva ..... Officer in charge.
Venancio N. Fernandez ..... Forest guard.
Forest Station at Butuan, Agusan:
Angel Mallonga ..... Officer in charge.
Rufo Burnea ..... Forest guard.
Forest Station at Kolambugan, Lanao:
Bernardo Tocmo ..... Officer in charge.
Lucio Abalos ..... Ranger.
Pedro C. Carro ..... Forest guard.
Guillermo Luñgay ..... Forest guard.
Forest Station at Dipolog, Zamboanga:
Manuel Malana ..... Officer in charge.
Forest Station at Cagayan, Misamis:
Timoteo Quimpo ..... Officer in charge.

DIVISION OF FOREST LANDS AND MAPS

Rafael Medina ..... Forester, Chief.
Doroteo Soriano ..... Forest supervisor, Assistant to the chief.
Cecilio Maneja ..... Forest supervisor.
Severo S. Ponce ..... Forest supervisor.
Vicente Castillo ..... Ranger.
Aquilino Contreras ..... Ranger.
Crispino Tansioco ..... Ranger.
Julio Baldemor ..... Ranger.
Eugenio de la Cruz ..... Ranger.
Vicente Caguioa ..... Ranger.

Leoncio de la Cruz	Ranger.
Pedro Aduviso	Ranger.
Vicente Parras	Ranger.
Gervasio Rarang	Ranger.
Juan Oblina	Ranger.
Magdaleno Tugade	Ranger.
Juan Fontanoza	Ranger.
Celso Medrano	Ranger.
Antonio Quiaoit	Ranger.
Gregorio Zamuco	Ranger.
Leonardo F. Granada	Ranger.
Rafael San Pedro	Ranger.
Felix Mabbayag	Ranger.
Ambrosio Damo	Ranger.
Jose B. Logan	Ranger.
Hilario Borromeo	Forest guard.
Cornelio Samaniego	Draftsman.
Gregorio Vicencio	Draftsman.
Hermogenes Reyes	Draftsman.
Cecilio de la Cruz	Draftsman.
Sebastian Domingo	Draftsman.
Marcelino Cruz	Draftsman.
Cayetano Crisostomo	Draftsman.
Angel Reyes	Draftsman.
Wenceslao Moje	Draftsman.
Alberto Gutierrez	Draftsman.
Luis Angeles	Draftsman.
Juan Acojido	Clerk.
Eligio Cordero	Clerk.
Conrado Tongco	Clerk.
Edilberto Barot	Clerk.

DIVISION OF INVESTIGATION, LOS BAÑOS, LAGUNA

Otto W. Pflueger	Forester, Chief.
Theodore C. Zschokke	Forester.
August P. West	Technical employee.
Harold C. Cuzner	Technical employee.
Antonio P. Racelis	Forester.
Placido Dacanay	Forester.
Carlos Sulit	Ranger.
Jose F. Nano	Ranger.
Maximo Oro	Ranger.
Francisco Rola	Ranger.
Pioquinto de la Vega	Ranger.
Felipe Salvoza	Ranger.
Justino Esguerra	Ranger.
Nicolas Angeles	Nurseryman.
Florentino Canicosa	Nurseryman.
Domingo Ilag	Nurseryman.
Maximo Pañga	Nurseryman.
Julian Rebelleza	Nurseryman.
Severino Casimiro	Nurseryman.

DIVISION OF SAWMILLS AND UTILIZATION[1]

William Crosby	Forester, Chief.
Luis J. Reyes	Forester.
Justo M. Pascual	Ranger.
Alberto Barros	Ranger.
Fortunato Manuel	Ranger.
Pablo Roque	Forest guard.
Sinforoso Apacible	Forest guard.
Doroteo Abella	Clerk.
Aurelio Maglunog	Clerk.
Andres G. Ferrer	Clerk.

ADMINISTRATIVE DIVISION

Vicente C. Ramos	Chief clerk.
Dominador G. Castro	Senior stenographer.
Aurea Villaruz (Miss)	Junior stenographer.

ACCOUNTING SECTION

Eugenio Tadle	Chief.
Melchor Enriquez	Clerk.
Aguedo Castro	Clerk.
Deogracias Antonio	Clerk.
Arcadio Gepiga	Clerk.
Patricio Ortega	Clerk.
Miguel Laguitao	Clerk.
Felipe Reyes	Clerk.

PROPERTY SECTION

Cirilo Asperilla	Property clerk, Cashier and Disbursing officer.
Pablo D. Villena	Clerk.
Venancio Babida	Clerk.
Santiago Laya	Clerk.
Victorino Narcelles	Clerk.
Agapito Arada	Clerk.
Francisco Sonto	Clerk.
Demetrio Saluñga	Clerk.

RECORD SECTION

Sulpicio Olimpo	Chief.
Aquilino Bartolome	Clerk.
Laureano Navasca	Clerk.
Agustin Cardines	Clerk.
Jose Salvador	Clerk.
Juan G. Loteyro	Clerk.
Angel Cosca	Clerk.

LIBRARY AND STATISTICAL SECTION

Simplicio Beltran	Chief.

GENERAL SERVICE SECTION

Gabino Cubos	Chauffeur.
Mauro Linchanco	Messenger.
Balbino B. Nanong	Messenger.

[1] All scalers under Division of Forest Management are also under this division.

Francisco Balderosa	Messenger.
Bartolome Estacio	Porter.
Severino Esguerra	Watchman.
Manuel Perez	Watchman.
Fernando Rañada	Janitor.
Benito Zambales	Janitor.
Pastor Ramos	Janitor.
Victoriano Dizon	Janitor.
Agustin Lagan	Janitor.

APPENDIX

STATISTICAL TABLES

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certification made to the same regarding the agricultural or forest value*

Province.	Received from the Bureau of Lands.									Certification made to the Bureau of Lands.			
	Pending from previous year.				During the year 1921.				Total.	Agriculture.			
	A. C.	H.	P.	L.	A. C.	H.	P.	L.		A. C.	H.	P.	L.
Abra		2	2						4				
Agusan		49	1	3		102	10	6	171			1	
Albay		57	8			21	1		87				
Antique		1				1			2				
Bataan		30	11	4		1			46			1	
Batanes		1							1				
Batangas													
Bohol		12		2	56				70	56	1		
Bukidnon		1		1		23	1	4	30				
Bulacan		3							3				
Cagayan		36	1			116	13		166				
Camarines Norte		73	8			10			91		7	2	
Camarines Sur		87	12	4		12			115			4	2
Capiz		19	1						20				
Cavite													
Cebu		10	2	3		1			16				
Cotabato		229	8	16		236	7	17	513		37		1
Davao		164	7	27		90	10	34	332		10	1	2
Ilocos Norte		2	3						5			2	
Ilocos Sur		20	1						21		1	1	
Iloilo		2	2						4				
Isabela		59	7			375	18	8	467				
Laguna		11							11		1		
Lanao		28	2	1		76	10	9	126		2	1	1
La Union		20		1			2		23		4		
Leyte		149	5						154		18	4	
Marinduque				1					1				
Masbate		23	4	1		4			32				
Mindoro		211	9			241	12	7	480		16		1
Misamis		7				3	1		11				
Mountain Province		19	1			6	2		28				
Nueva Ecija		133	29	4		183		17	366		11	7	1
Nueva Vizcaya		34	7			274	9	30	354		14		1
Occidental Negros		35		3		25		2	65		7		1
Oriental Negros		6				2			8				
Palawan		39	6			18			63				

Pampanga		14	1	1				16		1		1
Pangasinan		58	1	2		16	4	81		33	3	2
Rizal		3		1				4		1		
Romblon		13	3			1		17		1	1	
Samar		31	1				1	33		2		
Sorsogon		37	1			7		45		1		
Sulu				1		2	1	4				
Surigao		20	1					21		3		
Tarlac		55	3					58				
Tayabas		647	45	3		58	7	760		25	3	
Zambales		32	4	8		22	1	1	68		1	
Zamboanga		73	2	1		170	21	22	289		6	2	
Total		2,555	199	88	56	2,096	130	158	5,282	56	203	33	13

Province.	Certification made to the Bureau of Lands.					Returned to the Bureau of Lands, uncertified during the year 1921.				Total pending for inspection, December 31, 1921.				
	Forestry.				Total.									
	A. C.	H.	P.	L.		H.	P.	L.	Total.	A. C.	H.	P.	L.	Total.
Abra											2	2		4
Agusan					1						151	10	9	170
Albay		3			3	2			2		73	9		82
Antique											2			2
Bataan					1						31	10	4	45
Batanes											1			1
Batangas														
Bohol					57						11		2	13
Bukidnon											24	1	5	30
Bulacan											3			3
Cagayan											152	14		166
Camarines Norte					9						76	6		82
Camarines Sur					6						99	8	2	109
Capiz											19	1		20
Cavite														
Cebu											11	2	3	16
Cotabato					38						428	15	32	475
Davao					13	3		5	8		241	16	54	311
Ilocos Norte					2						2	1		3
Ilocos Sur					2						19			19
Iloilo											2	2		4
Isabela											434	25	8	467
Laguna					1						10			10
Lanao		1			5						101	11	9	121
La Union					4						16	2	1	19
Leyte					22						131	1		132

NOTE.—A. C. = Agricultural Colony of 16 hectares lot; H. = Homestead; P. = Purchase; L. = Lease.

TABLE No. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certification made to the same regarding the agricultural or forest value*—Continued

Province.	Certification made to the Bureau of Lands.					Returned to the Bureau of Lands, uncertified during the year 1921.				Total pending for inspection, December 31, 1921.				
	Forestry.				Total.									
	A. C.	H.	P.	L.		H.	P.	L.	Total.	Total.	H.	P.	L.	Total.
Marinduque													1	1
Masbate											27	4	1	32
Mindoro					17	1	1		2		455	20	6	461
Misamis						3			3		7	1		8
Mountain Province											25	3		28
Nueva Ecija					19						305	22	20	347
Nueva Vizcaya					15						294	16	29	339
Occidental Negros		1			1						7			7
Oriental Negros				2	10						53		2	55
Palawan											57	6		63
Pamapanga					2						13	1		14
Pangasinan		5			43						36	2		38
Rizal					1						2		1	3
Romblon					2						13	2		15
Samar					2						29	2		31
Sorsogon		1			2						42	1		43
Sulu											2		2	4
Surigao					3						17	1		18
Tarlac		2			2						53	3		56
Tayabas		9			37	1	2		3		670	47	3	720
Zambales		1			2						52	5	9	66
Zamboanga		2			10						235	21	23	279
Total		25		2	332	10	3	5	18		4,413	293	226	4,932

NOTE.—A. C. = Agricultural Colony of 16 hectares lot; H. = Homestead; P. = Purchase; L. = Lease.

Fiscal year.	Agricultural colonies.			Homesteads.			Sales.			Leases.			Grand total.
	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	Agriculture.	Forest.	Total.	
1905	.....	.....	.....	80	6	86	8	.....	8	.....	.....	.....	94
1906	.....	.....	.....	318	16	334	20	1	21	1	.....	1	356
1907	.....	.....	.....	881	19	900	23	.....	23	12	.....	12	935
1908	.....	.....	.....	2,456	51	2,507	49	1	50	26	.....	26	2,583
1909	.....	.....	.....	1,523	187	1,710	26	3	29	27	.....	27	1,766
1910	.....	.....	.....	1,175	385	1,560	34	5	39	42	2	44	1,643
1911	.....	.....	.....	1,528	221	1,749	46	3	49	30	1	31	1,829
1912	.....	.....	.....	2,609	301	2,910	95	11	106	47	1	48	3,064
1913	.....	.....	.....	2,680	269	2,949	104	30	134	47	1	48	3,131
1913 (July 1 to December 31)	.....	.....	.....	1,653	159	1,812	81	16	97	41	3	44	1,953
1914	.....	.....	.....	4,812	685	5,497	279	36	315	77	1	78	5,890
1915	1,086	28	1,114	5,965	688	6,653	317	52	369	70	1	71	8,207
1916	934	41	975	6,015	670	6,685	227	18	245	55	4	59	7,964
1917	670	.....	670	7,632	797	8,429	457	27	484	118	6	124	9,707
1918	41	.....	41	5,605	621	6,226	420	33	453	109	16	125	6,845
1919	.....	.....	.....	5,256	790	6,046	431	51	482	137	22	159	6,687
1920	.....	.....	.....	2,061	403	2,464	225	23	248	70	10	80	2,792
1921	56	.....	56	203	25	228	33	.....	33	13	2	15	332
Total	2,787	69	2,856	52,452	6,293	58,745	2,875	310	3,185	922	70	992	65,778

SUMMARY

Applications on hand during 1921		5,282
Certified for agriculture	305	
Certified for forestry	27	
Returned uncertified	18	350
Total pending December 31, 1921		4,932

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1921*

Species.	Fiscal year—				July 1 to December 31, 1913.
	1910	1911	1912	1913	
Red lauan					
White lauan	43,439	46,942	57,036	81,469	20,249
Apitong	20,764	21,096	28,929	32,391	12,905
Tangile	2,106	2,762	3,999	5,249	3,390
Guijo	14,107	14,231	18,579	17,279	7,841
Yakal	8,225	8,150	14,491	21,770	5,593
Ipil	13,717	12,296	17,237	15,791	7,535
Molave	8,923	7,978	9,091	9,363	4,783
Narra	5,744	4,996	8,474	8,877	3,941
Kalantas	3,174	1,368	938	3,320	886
Palosapis					
Mangachapuy					
Dungon	2,453	1,693	1,213	931	601
Tindalo	954	1,018	794	932	484
Akle	809	867	1,295	1,690	729
Lumbayao					
Pagatpat					
Other species:					
First group	574	322	707	1,000	687
Second group	6,667	6,644	7,988	8,543	3,266
Third group	8,316	10,927	11,796	8,711	2,999
Fourth group	36,786	41,655	42,981	59,855	25,613
Total	176,758	182,945	225,548	277,171	101,502

	Fiscal year—				
	1914	1915	1916	1917	1918
Red lauan					
White lauan	74,453	73,277	107,634	131,699	108,900
Apitong	32,328	38,849	52,529	55,335	56,274
Tangile	14,682	15,460	28,961	25,389	21,775
Guijo	19,701	15,650	16,685	16,857	17,301
Yakal	15,115	14,714	16,471	11,963	9,162
Ipil	17,602	12,089	14,147	16,629	15,498
Molave	9,753	10,546	10,788	13,582	22,233
Narra	8,467	9,868	7,970	5,904	7,848
Kalantas	2,423	1,999	4,574	7,381	4,975
Palosapis	2,222	1,631	2,723	3,042	8,863
Mangachapuy	1,469	1,859	2,666	2,916	2,214
Dungon	2,199	1,467	1,127	1,592	1,318
Tindalo	914	1,181	1,115	1,145	826
Akle	1,287	1,498	1,088	798	870
Lumbayao				6,085	4,415
Pagatpat				1,502	849
Other species:					
First group	2,196	2,190	3,074	1,084	1,416
Second group	9,373	6,940	7,938	6,432	7,779
Third group	7,557	6,920	5,214	9,895	8,611
Fourth group	73,017	60,130	56,738	47,661	80,933
Total	294,758	276,268	341,442	366,891	382,060

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1921*—Continued.

Species.	Fiscal year—			Total, 1910 to 1921.
	1919	1920	1921	
Red lauan		52,294	72,986	125,280
White lauan	180,556	119,833	125,536	1,171,023
Apitong	72,223	99,775	99,652	623,050
Tangile	35,005	40,903	47,311	246,992
Guijo	25,924	28,413	30,625	243,220
Yakal	11,100	20,317	28,245	192,316
Ipil	18,926	24,720	28,556	214,743
Molave	26,088	30,173	31,826	195,127
Narra	11,152	12,711	16,164	112,116
Kalantas	5,040	8,622	5,350	50,050
Palosapis	15,661	7,594	5,928	47,664
Mangachapuy	3,096	3,094	4,340	21,654
Dungon	1,839	2,607	2,726	21,766
Tindalo	1,080	1,387	2,404	14,234
Akle	937	2,047	1,553	15,468
Lumbayao	4,192	7,550	8,179	30,421
Pagatpat	2,766	4,743	5,454	15,314
Other species:				
First group	3,335	9,104	17,352	43,041
Second group	12,084	17,414	29,304	130,372
Third group	53,513	1,978	15,253	151,690
Fourth group	3,711	59,718	75,173	663,971
Total	495,228	554,997	653,944	4,329,512

NOTE.—Figures after white lauan, from 1910 to 1919, represent both lauans. It will be noted from the above that the separation was only made during 1920.

TABLE NO. 3.—*Revenues from sale of forest products, January 1 to December 31, 1921*

Province.	Charges on forest products.								
	Timber.				Firewood.		Minor products.	Lease of forest lands.	Total.
	First group, ₱2.50 per cubic meter.	Second group, ₱1.50 per cubic meter.	Third group, ₱1 per cubic meter.	Fourth group, ₱0.50 per cubic meter.	Bacauan and tangal, ₱0.20 per cubic meter.	Others, ₱0.10 per cubic meter.			
Abra	₱2,918.88	₱1,146.31	₱535.94	₱136.68	₱57.50	₱145.31	₱331.40	.....	₱5,272.02
Agusan	3,872.91	188.61	276.46	128.29	12.35	11.80	938.42	.....	5,428.84
Albay	9,254.09	2,619.21	2,345.31	647.34	273.86	257.01	5,587.67	.....	20,984.49
Antique	682.53	65.42	166.79	36.99	8.40	10.19	316.93	.....	1,287.25
Bataan	209.86	1,607.86	4,681.16	4,332.29	401.50	827.99	2,184.57	.....	14,245.23
Batangas	1,899.73	1,442.72	79.16	64.80	37.91	282.17	1,351.83	₱1.00	5,159.32
Bohol	1,790.67	216.17	80.58	468.07	887.27	1,317.32	792.56	.....	5,552.64
Bukidnon	253.63	43.11	9.12	10.85	61.72	40.30	203.35	.....	622.08
Bulacan	1,074.96	923.89	1,197.39	780.98	368.55	69.88	1,001.32	.....	5,416.97
Cagayan	9,834.22	1,369.09	3,332.96	622.75	265.42	280.95	5,066.77	12.50	20,784.66
Camarines Norte	545.61	318.50	654.57	368.33	346.93	33.64	2,477.50	.....	4,745.08
Camarines Sur	1,573.18	1,337.87	1,832.70	875.01	102.60	213.56	4,722.79	.....	10,657.71
Capiz	432.40	162.86	1,608.60	1,449.66	4,201.94	461.57	1,128.63	.....	9,445.66
Cavite	21.96	3.19	.54	.36	4.42	133.97	688.23	.....	852.67
Cebu	2,091.09	303.27	1,210.25	1,517.26	3,396.99	1,039.51	562.95	61.31	10,182.63
Cotabato	12,161.96	5,875.97	3,321.95	6,278.15	1,289.07	104.35	1,114.70	.....	30,146.15
Davao	1,814.39	696.96	608.81	2,693.21	319.17	163.08	5,269.94	.....	11,565.56
Ilocos Norte	1,641.57	842.74	298.59	125.85	20.70	56.25	142.44	.....	3,128.14
Ilocos Sur	526.54	268.08	64.78	66.76	18.20	57.20	244.27	.....	1,245.83
Iloilo	16,285.75	2,833.30	1,469.45	1,144.19	1,151.00	1,926.76	2,317.66	.....	27,128.11
Isabela	5,022.03	1,775.78	921.50	372.66	33.57	75.89	248.28	.....	8,449.71
Laguna	164.88	661.72	1,106.55	433.58	2.13	113.70	1,109.02	.....	3,591.58
Lanao	483.23	89.12	176.71	83.32	.....	33.57	111.98	.....	977.93
La Union	509.59	258.99	56.84	82.07	6.55	.05	109.39	2.00	1,025.48
Leyte	6,399.01	1,155.23	7,385.23	2,932.13	1,224.32	106.43	3,562.46	.....	22,764.81
Manila	85,672.49	21,619.50	159,143.22	64,594.52	1,676.42	3,985.08	5,915.75	111.00	342,717.98
Marinduque	169.48	122.54	71.31	40.17	118.92	103.38	300.96	.....	926.76
Masbate	10,285.72	857.87	408.74	1,269.05	439.22	170.33	1,578.28	131.00	15,140.21
Mindoro	1,392.16	917.51	864.45	1,177.04	607.74	179.56	3,522.64	.....	8,661.10
Misamis	1,522.25	1,101.89	1,871.03	1,092.43	47.14	231.55	867.91	.....	6,734.20
Mountain	819.04	1,455.82	6,653.75	455.34	72.08	728.55	789.60	.....	10,974.18
Nueva Ecija	3,555.90	1,230.75	43.34	93.45	6.72	285.46	2,787.87	.....	8,003.49
Nueva Vizcaya	727.65	54.00	18.12	5.47	5.80	100.49	96.28	.....	1,007.81
Occidental Negros	1,714.26	339.44	414.95	461.29	204.24	380.34	7,161.75	.....	10,776.27
Oriental Negros	7,669.54	2,879.01	2,689.32	2,361.26	719.73	777.52	4,779.50	.....	21,875.88
Palawan	3,684.61	165.47	30.66	208.15	145.48	67.78	3,490.46	.....	7,792.53
Pampanga	105.58	1,254.14	813.43	237.36	129.05	1,538.49	927.96	.....	5,006.01

Pangasinan	5,590.04	3,172.42	1,609.90	469.68	1,113.83	442.78	1,700.00	.....	14,098.65
Rizal	226.77	238.78	137.05	312.59	16.78	524.27	1,607.32	.....	3,063.56
Romblon	1,762.41	6,816.63	310.78	118.45	35.50	99.28	1,082.51	.....	10,225.56
Samar	7,473.18	1,213.39	1,772.18	775.60	375.19	764.36	4,444.69	.....	16,818.59
Sorsogon	9,038.26	2,993.65	1,164.67	1,196.28	1,261.90	159.97	2,328.10	66.00	18,208.83
Sulu	9,215.04	657.92	1,294.17	254.61	925.00	.....	1,364.18	.....	13,710.92
Surigao	2,084.35	362.63	476.55	99.76	561.04	13.53	5,147.91	.....	8,745.77
Tarlac	536.46	226.87	55.24	50.66	3.10	98.57	1,049.46	.....	2,020.36
Tayabas	29,840.91	3,472.58	3,122.88	1,720.62	6,067.06	3,440.51	13,920.49	51.15	61,636.20
Zambales	1,615.30	1,714.47	2,087.20	651.80	532.16	536.88	1,831.02	.....	8,968.83
Zamboanga	17,912.95	9,373.87	42,422.04	14,534.84	3,133.75	801.44	7,262.53	.....	95,441.42
Total charges	284,079.02	88,447.12	260,896.92	117,932.00	32,689.92	23,192.49	115,542.23	435.96	923,215.66
Total fines and penalties	32,632.25	11,414.72	11,599.75	11,013.80	3,249.89	4,309.17	15,715.92	.....	89,935.50
Grand total	316,711.27	99,861.84	272,496.67	128,945.80	35,939.81	27,501.66	131,258.15	435.96	1,013,151.16

TABLE NO. 4.—*Timber licenses issued during the fiscal year 1921 (January 1 to December 31)*

Province.	For less than 100 cubic meters.	For 100 cubic meters and less than 1,000 cubic meters.	For 1,000 cubic meters and over.	License agreements	Total commercial licenses.	For personal use.		For public works.	Miner's gratuitous licenses.	Total.
						Inside communal forests.	Outside communal forests.			
Abra	42	51	.....	.....	93	13	8	2	.....	23
Agusan	8	1	2	.....	11	4	59	2	1	66
Albay	8	20	13	.....	41	77	29	.....	.....	106
Antique	11	4	.....	.....	15	3	5	2	.....	10
Bataan	11	14	38	2	65	.....	.....	2	.....	2
Batangas	5	8	.....	.....	13	1	4	3	.....	8
Bohol	14	7	.....	.....	21	161	4	2	.....	167
Bukidnon	.....	1	3	.....	4	.....	8	2	.....	10
Bulacan	10	52	9	.....	71	.....	5	2	9	16
Cagayan	10	81	15	.....	106	27	34	2	1	64
Camarines Norte	5	14	4	.....	23	.....	3	2	15	20
Camarines Sur	22	24	4	1	51	22	9	2	.....	33
Capiz	31	44	1	.....	76	18	1	2	.....	21
Cavite	1	.....	.....	.....	1	.....	.....	2	.....	2
Cebu	30	16	2	.....	48	23	38	3	5	69
Cotabato	5	2	2	.....	9	.....	.....	2	.....	2
Davao	23	31	21	.....	75	1	64	2	.....	67
Ilocos Norte	38	31	5	.....	74	42	2	3	.....	47
Ilocos Sur	30	1	.....	.....	31	32	12	5	.....	49
Iloilo	19	21	1	.....	41	.....	2	2	.....	4
Isabela	34	30	3	.....	67	150	2	2	.....	154
Laguna	22	30	3	.....	55	.....	1	2	.....	3
Lanao	3	.....	2	1	6	2	.....	2	.....	4
La Union	19	4	.....	.....	23	25	2	3	.....	30
Leyte	40	51	9	.....	100	211	219	3	.....	433
Marinduque	2	9	1	.....	12	.....	.....	.....	.....	.....
Masbate	8	35	18	2	63	14	23	.....	8	45
Mindoro	11	50	28	.....	89	4	8	2	.....	14
Misamis	6	11	1	.....	18	138	10	2	.....	150
Mountain Province	52	36	5	1	94	4	13	3	3	23
Nueva Ecija	15	22	1	.....	38	58	14	2	.....	74
Nueva Vizcaya	22	5	2	.....	29	29	11	2	.....	42
Occidental Negros	8	37	23	2	70	4	.....	2	.....	6
Oriental Negros	6	8	3	.....	17	8	17	3	.....	28
Palawan	11	5	35	.....	51	.....	25	2	.....	27
Pampanga	.....	14	4	.....	18	.....	.....	2	.....	2
Pangasinan	24	66	11	.....	101	133	3	2	7	145
Rizal	9	13	1	.....	23	.....	.....	2	.....	2
Romblon	2	9	4	.....	15	5	12	2	.....	19
Samar	91	50	8	.....	149	278	33	2	.....	313
Sorsogon	11	25	5	.....	41	.....	1	2	.....	3

Sulu	.....	2	6	.....	8	.....	.....	2	.....	2
Surigao	42	11	3	.....	56	88	106	2	2	198
Tarlac	4	13	2	.....	19	86	6	2	.....	94
Tayabas	16	83	71	1	171	24	3	3	6	36
Zambales	10	26	13	.....	49	62	.....	2	.....	64
Zamboanga	16	16	21	5	58	49	50	2	.....	101
All provinces	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Total	807	1,084	403	15	2,309	1,796	846	100	57	2,799
Total 1920	534	1,470	473	15	2,493	1,481	1,045	103	63	2,692
Difference	+273	—386	—70	.....	—184	+315	—199	—3	—6	—107

NOTE.— + = increase; — = decrease.

In the Provinces of Cagayan, Isabela, Abra, La Union, and Mountain Province, 378 licenses were issued for building tobacco curing-houses.

TABLE No. 5.—*Statement of forest products, cut or gathered from registered private woodlands during the fiscal year 1921*

Province.	Timber.					Firewood.		Charcoal.	Tanbark.	Split rattan.	Diliman.	Daluru.	Buri.	White earth balls.
	First group.	Second group.	Third group.	Fourth group.	Total.	First class.	Second class.							
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Kilos.*	*Cu. m.*	*Kilos.*	*Number.*
Bataan	1	16	58	43	118	100	33	88	.....	.....	880	.....	.....	.....
Batangas	20	98	.....	224	342	.....	.....	.....	2,850	.....	.....	.....	.....	.....
Bulacan	.....	.....	.....	.....	.....	1,320	50	.....	.....	.....	.....	.....	.....	.....
Cagayan	14	.....	.....	.....	14	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cavite	.....	.....	.....	.....	.....	.....	.....	60	.....	.....	.....	.....	.....	.....
Iloilo	.....	.....	.....	.....	.....	.....	361	32	.....	.....	.....	.....	.....	.....
Laguna	.....	.....	.....	.....	.....	.....	1,372	3,498	.....	.....	.....	.....	16	1,200
Masbate	51	.....	.....	.....	51	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mindoro	33	4	.....	.....	37	20	.....	.....	.....	.....	.....	.....	.....	.....
Nueva Ecija	.....	.....	.....	.....	.....	.....	377	.....	.....	.....	.....	.....	.....	.....
Occidental Negros	94	.....	.....	.....	94	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental Negros	44	122	169	176	511	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pampanga	.....	.....	.....	.....	.....	11,802	2,771	106	.....	.....	.....	4	.....	.....
Rizal	101	7	12	149	269	6	3,791	.....	.....	.....	.....	.....	.....	.....
Romblon	149	202	8	.....	359	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sorsogon	345	.....	.....	.....	345	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tarlac	37	56	14	45	152	.....	3,740	.....	.....	1,000	.....	.....	.....	.....
Tayabas	.....	.....	.....	.....	.....	.....	.....	83	.....	.....	.....	.....	.....	.....
Zambales	.....	.....	.....	.....	.....	.....	392	.....	.....	.....	.....	.....	.....	.....
Total	889	505	261	637	2,292	13,248	12,887	3,867	2,850	1,000	880	4	16	1,200

TABLE No. 6.—*Minor products licenses issued during the fiscal year 1921 (January 1 to December 31)*

Province.	Firewood.	Charcoal.	Dye wood.	Tanbarks and dyebark.	Wood oils.	Almaciga, resins, and others.	Gutta-percha.	Rattan and diliman.	Gogo.	Sand, gravel, and stone.	Others.	Total.
Abra	18	.....	.....	.....	.....	.....	.....	16	.....	1	1	36
Agusan	5	1	.....	.....	.....	1	.....	34	.....	.....	.....	41
Albay	37	.....	.....	3	.....	1	.....	38	.....	.....	2	81
Antique	1	.....	.....	.....	.....	1	.....	20	.....	.....	.....	22
Bataan	34	16	.....	.....	1	4	.....	70	17	.....	1	143
Batangas	10	.....	.....	8	.....	.....	.....	2	.....	.....	9	29
Bohol	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	29
Bukidnon	2	.....	.....	.....	.....	.....	1	12	.....	.....	.....	15
Bulacan	4	15	.....	1	.....	2	.....	30	3	.....	.....	55
Cagayan	26	.....	.....	2	1	6	.....	90	.....	.....	1	126
Camarines Norte	6	.....	.....	1	.....	1	.....	13	.....	.....	4	25

Camarines Sur	43	2		8	1	30		627	2	2	2	717
Capiz	54	5		3				11	2		5	80
Cavite	7	1		2					9			19
Cebu	90	2						4	1		25	122
Cotabato	10		1	2		2	9	6	2		12	44
Davao	36	5	1			12		12		2	18	86
Ilocos Norte	14			2				7	1		3	27
Ilocos Sur	6			1						3	24	34
Iloilo	91	12	21	11	2			16			9	162
Isabela	11					1		27				39
Laguna	11	6		3		1		27	12		20	80
Lanao	6			1			2	11			8	28
Leyte	42	2		1	5			35		15	2	102
Marinduque	9			7		4		12	1		1	34
Masbate	26			12		1		45	3		2	89
Mindoro	48	1		29		4		103	27		9	221
Misamis	17			1		1		19			5	43
Mountain Province	24	4		2	1			31		10	8	80
Nueva Ecija	13	1				3		48	39		16	120
Nueva Vizcaya	5							18				23
Occidental Negros	60			3	16	2		200	39	1	12	333
Oriental Negros	15				9			36	6		2	68
Palawan	52			59	4	32		44	12		13	216
Pampanga	12	4						10	5		3	34
Pangasinan	38	1	1	24				8	8		5	85
Rizal	33	12		4		2		16	10		8	85
Romblon	4			2	9	10		5	1		3	34
Samar	34			5	4	1		90			1	135
Sorsogon	32			5	4	2		18				61
Sulu	2	1		1								4
Surigao	21	4		7	2	1		25		4		64
Tarlac	11	3		3		1		13	11		4	46
Tayabas	100	14	1	34	3	113		130	17	5	38	455
Zambales	46	7		8		5		36	9		8	119
Zamboanga	37	11		12		13	12	50			9	144
Total	1,230	130	25	267	62	257	24	2,065	237	43	295	4,635
Total (1920)	1,194	108	27	188	72	248	33	1,646	165	64	166	3,911
Difference	+36	+22	—2	+79	—10	+9	—9	+419	+72	—21	+129	+724

NOTE.—+ = increase; — = decrease.

TABLE NO. 6-A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1921 (January 1 to December 31)*

Province.	Timber.					Firewood.		Charcoal.	Dyewood.	Tanbark.
	First group.	Second group.	Third group.	Fourth group.	Total.	First class.	Second class.			
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Kilos.*
Abra	1,493	677	732	379	3,481	.....	3,064	.....	.....	.....
Agusan	3,347	293	175	185	4,000	62	9	4	.....	.....
Albay	5,428	2,441	3,310	1,619	12,798	968	2,401	.....	.....	4,785
Antique	1,010	237	299	109	1,655	.42	.....	.....	.....	.....
Bataan	77	6,113	46,387	22,427	75,004	1,903	14,520	946	.....	.....
Batangas	196	67	16	72	351	40	2,518	36	.....	38,898
Bohol	1,049	472	304	596	2,421	21,396	15,837	8	.....	3,248
Bukidnon	10	8	8	16	42	.....	.....	.....	.....	.....
Bulacan	709	1,366	2,453	2,232	6,760	665	1,321	1,006	.....	1,138
Cagayan	5,812	794	3,115	931	10,652	1,315	3,963	.....	.....	10,580
Camarines Norte	475	645	2,307	1,161	4,598	1,720	1,726	.....	.....	29,240
Camarines Sur	2,379	3,546	11,505	5,107	22,537	940	2,221	.....	.....	75,515
Capiz	130	132	2,405	2,559	5,226	22,447	7,867	431	.....	14,565
Cavite	.....	21	4	.....	25	.....	1,506	36	.....	800
Cebu	295	135	378	502	1,310	387	10,309	15	.....	4,903
Cotabato	5,335	4,751	3,988	7,810	21,884	1,631	9,613	.....	.....	801
Davao	902	871	1,201	4,157	7,131	1,460	239	166	.....	1,659
Ilocos Norte	743	441	316	389	1,889	40	849	.....	.....	3,806
Ilocos Sur	280	42	74	55	451	.....	522	.....	.....	2,840
Iloilo	423	1,308	680	871	3,282	5,524	21,672	291	25,069	238,271
Isabela	2,695	1,548	1,504	727	6,474	5	377	.....	.....	.....
Laguna	51	673	1,741	1,035	3,500	2	1,875	525	.....	1,525
Lanao	386	693	34,442	15,077	50,598	20	308	.....	.....	280
La Union	244	216	74	84	618	.....	80	.....	.....	9,500
Leyte	3,835	915	6,503	3,807	15,060	4,664	806	11	.....	1,212
Marinduque	89	208	111	79	487	5,331	3,678	.....	1,800	.....
Masbate	9,968	3,467	1,769	3,014	18,218	1,824	4,149	35	.....	75,461
Mindoro	2,012	4,143	2,449	4,435	13,039	10,779	1,841	13	.....	78,180
Misamis	533	462	14,394	1,869	17,258	255	2,198	.....	.....	916
Mountain Province	1,006	509	6,986	1,982	10,483	.....	19,035	5	.....	.....
Occidental Negros	2,731	2,928	40,044	73,049	118,752	6,581	6,849	.....	.....	3,631
Oriental Negros	912	498	319	1,163	2,892	248	3,523	.....	.....	5,870
Nueva Ecija	1,721	875	139	126	2,861	.....	3,348	28	.....	3,740
Nueva Vizcaya	315	118	85	10	528	.....	856	.....	.....	3,375
Palawan	27,830	456	52	304	28,642	706	143	.....	.....	172,911
Pampanga	188	813	3,599	3,545	8,145	1,507	13,803	221	.....	4,457
Pangasinan	3,034	2,889	2,274	1,501	9,698	7,487	3,368	88	.....	273,021
Rizal	93	205	176	711	1,185	82	16,380	272	.....	526
Romblon	1,047	5,267	407	59	6,780	20	31	.....	.....	.....

Samar	3,030	1,424	3,897	3,409	12,560	4,887	260	.....	.....	194,040
Sorsogon	8,665	1,117	1,108	1,865	12,755	5,034	1,008	7	.....	5,848
Sulu	4,196	1,023	1,512	706	7,437	3,442	311	894	.....	168,045
Surigao	1,335	235	157	231	1,958	2,027	785	3	1,300	112,845
Tarlac	500	147	35	122	824	.....	3,390	427	.....	2,094
Tayabas	17,004	3,787	22,502	6,131	49,427	29,983	33,045	1,726	.....	155,524
Zambales	1,291	1,410	3,430	2,229	8,360	2,424	7,823	65	.....	2,340
Zamboanga	5,846	6,426	25,374	22,262	59,908	9,373	14,240	25	.....	593,504
Total	131,450	67,022	254,763	200,709	653,944	157,259	243,667	7,284	38,167	2,299,894
Total (1920)	109,081	51,528	214,837	179,551	554,997	597,787	259,294	8,129	1,049,467	1,157,575
Difference	+22,369	+15,494	+39,926	+21,158	+98,947	—440,528	—15,627	—845	—1,011,298	+1,142,319

Province.	Wood oils.	Copal gum.	Daluru.	Gutta-percha	Split rattan.	Unsplit rattan.		Diliman.	Limestone.	Gogo.
						Over 2 centimeters in diameter.	Two centimeters in diameter or less.			
	Liters.	*Kilos.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Lin. m.*	*Lin. m.*	*Kilos.*	*Kilos.*	*Kilos.*
Abra	.....	.....	.....	.....	.....	44,500	331,352	.....	50,000	.....
Agusan	.....	.....	.....	.....	70,555	1,280	13,180	2,226	.....	.....
Albay	.....	200	.....	.....	230,983	1,170	.....	726	.....	.....
Antique	.....	.....	.....	.....	13,040	.....	.....	2,828	.....	.....
Bataan	.....	.....	.....	.....	67,037	89,390	91,750	2,106	.....	1,803
Batangas	.....	.....	.....	.....	442	.....	1,250	327	35,000	22,271
Bohol	294	.....	.....	.....	427	.....	.....	630	.....	117
Bukidnon	.....	300	.....	600	15,613	.....	.....	.....	.....	.....
Bulacan	.....	40	.....	.....	12,125	50,050	785,940	.....	.....	42
Cagayan	.....	.....	.....	.....	215,679	96,810	96,164	.....	.....	.....
Camarines Norte	.....	.....	.....	.....	181,961	.....	24,410	1,767	7,000	.....
Camarines Sur	.....	129,891	.....	.....	204,119	45,720	208,335	1,001	.....	.....
Capiz	.....	.....	.....	.....	7,195	12,000	3,228	1,193	.....	.....
Cavite	.....	.....	.....	.....	.....	.....	.....	.....	.....	28,915
Cebu	.....	.....	.....	.....	2,313	.....	.....	4,164	.....	1,380
Cotabato	.....	.....	.....	34,938	268	.....	17,250	.....	.....	.....
Davao	1,304	299,896	.....	.....	6,323	38	52,985	1,179	.....	.....
Ilocos Norte	.....	.....	.....	.....	3,167	.....	.....	.....	20,000	120
Ilocos Sur	.....	.....	.....	.....	2,400	.....	.....	.....	63,942	.....
Iloilo	.....	.....	1	.....	4,267	.....	5,000	2,880	.....	195
Isabela	.....	.....	.....	.....	.....	34,040	67,949	.....	.....	.....
Laguna	.....	.....	.....	.....	23,558	.....	9,811	5,476	699	.....
Lanao	.....	.....	.....	.....	1,213	.....	.....	2,547	.....	.....
La Union	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leyte	32,578	.....	.....	.....	78,122	139,552	159,869	68,357	.....	82
Marinduque	.....	.....	.....	.....	5,335	.....	1,617	11,162	.....	.....
Masbate	.....	.....	.....	.....	60,302	.....	.....	7,340	.....	1,963
Mindoro	.....	.....	.....	.....	75,512	10,551	131,160	40,081	.....	4,177
Misamis	.....	743	10	.....	31,997	2,060	12,600	.....	.....	.....

TABLE NO. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1921 (January 1 to December 31)*

Province.	Wood oils.	Copal gum.	Daluru.	Gutta-percha	Split rattan.	Unsplit rattan.		Diliman.	Limestone.	Gogo.
						Over 2 centimeters in diameter.	Two centimeters in diameter or less.			
	Liters.	*Kilos.*	*Cu. m.*	*Kilos.*	*Kilos.*	*Lin. m.*	*Lin m.*	*Kilos.*	*Kilos.*	*Kilos.*
Mountain Province					117,457	71,120	8,500		135,989	
Nueva Ecija					40,044	18,772	564,630	1,199		11,649
Nueva Vizcaya					50		38,440			
Occidental Negros	7,764				251,125	7,168	11,195	10,952		9,242
Oriental Negros	63,976				303,517		8,370	3,060		16,636
Palawan	360	68,008			3,227		275,500			16,288
Pampanga			173		4,541		62	399		1,016
Pangasinan			47		1		13,200			2,540
Rizal					15,275			300		226
Romblon	3,971	14,103			1,460			30		38
Samar	1,210	34			215,611	5,850	25,180	18,209		
Sorsogon	46,536	2,971			22,041					213
Sulu		20			2,101					
Surigao	565				409,963					
Tarlac					27,407	4,010	275,925	125		8,542
Tayabas		63,819			385,666	1,030,593	2,056,760	25,304		111
Zambales		752			14,680	95,500	1,709,433			10,270
Zamboanga		8,760	300	5,733	42,362	4,964	1,577	871		
Total	158,558	589,537	531	41,271	3,170,481	1,765,138	7,002,622	216,439	312,630	137,836
Total (1920)	52,850	1,841,396	263	356,568	2,153,025	4,389,114	2,716,587	109,963	458,645	126,198
Difference	+105,708	—1,251,859	+268	—315,297	+1,017,456	—2,623,976	+4,286,035	+106,476	+146,015	+11,638

Province.	Stone, sand, and gravel.	Buri.	Guano.	Salago bark.	Nipa.	Dye bark.	Cabonegro.	Other vines for tying.	Gum elemi.	Fern trees.	Bees wax.
	Kilos.	*Kilos.*	*Kilos.*	*Kilos.*	*Shingles.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*No.*	*Kilos.*
Abra											
Agusan					10,035						
Albay						531					
Antique											
Bataan											
Batangas		22,425					776				
Bohol											
Bukidnon											

Bulacan											
Cagayan											
Camarines Norte											
Camarines Sur						6,250					
Capiz		3,171	2,000			2,455					
Cavite											
Cebu		24,898									
Cotabato					250				165		6,933
Davao											44
Ilocos Norte						4,050					
Ilocos Sur	32,240										
Iloilo			50,564								
Isabela											
Laguna	251						15,691	14,486			
Lanao					5,150						90
La Union											
Leyte	144										
Marinduque		4,093				8,970					
Masbate		9,160							2,300		
Mindoro		19,084		350		22,003					
Misamis									50		
Mountain Province	54									26	2
Occidental Negros			1,711								
Oriental Negros											
Nueva Ecija		87,018				99					
Nueva Vizcaya											
Palawan						66,701					481
Pampanga	1	50,922									
Pangasinan		6,725				1,366					
Rizal						920		3,522			
Romblon		26,309									
Samar						933					
Sorsogon						13,369			33		
Sulu											
Surigao	29										
Tarlac		6,490									
Tayabas	491	347,511				604	1,496	2,608	69,038		
Zambales					102,300	318					
Zamboanga											251
Total	33,210	607,806	54,275	350	117,735	128,569	17,963	20,616	71,586	26	7,801
Total (1920)	51,813	985,889	216		11,800	75,747	120				
Difference	—18,603	—378,083	+54,059	+350	+105,935	+52,822	+17,843	+20,616	+71,586	+26	+7,801

NOTE.— + = increase; — = decrease.

TABLE NO. 7.—*Statement showing the quantity and value of minor forest products exported during the fiscal year 1921 (January 1 to December 31)*

	Kilos.	Value.
Copal (almáciga):		
United States	135,495	₱25,154
United Kingdom	85,314	10,808
France	2,611	1,800
Germany	180	70
British East Indies	63,758	11,277
Japan	250,949	90,165
Australasia	4,393	1,333
Total	542,700	140,607
Elemi (pili resin):		
United States	23,797	5,620
Germany	4,985	1,994
Japan	195	75
Total	28,977	7,689
Gutta-percha:		
United States	1,054	550
United Kingdom	13,756	12,916
Total	14,810	13,466
Rubber:		
United States	22,330	16,000
British East Indies	18,297	9,700
Total	40,627	25,700
Lumbang (candle nut) oil:		
Spain	45	11
China	370	150
Total	415	161
Sappan wood (sibukao):		
China	190,395	5,361
Hongkong	12,650	420
Total	203,045	5,781
Grand total	.....	193,404

TABLE NO. 8.—*Statement of appropriation and expenditures, Bureau of Forestry (January 1 to December 31, 1921)*

Appropriation:		
Act No. 2935		₱589,745.00
Resolution No. 147		1,700.00
		591,445.00
Less reductions:		
Resolution No. 37	₱22,927.00	
Resolution No. 59	15,137.00	
		38,064.00
Total appropriation		553,381.00
Expenditures:		
Salaries and wages	332,539.22	
Bonus	43,634.40	
Traveling expenses of personnel	69,031.44	
Freight, express and delivery service	3,056.54	
Postal, telegraph and cable service	11,065.71	
Illumination and power service	4,440.63	
Miscellaneous services	1,530.20	
Rentals of buildings and grounds	10,016.43	
Consumption of supplies and materials	37,649.10	
Printing and binding report	3,624.73	
Traveling expenses not government employees	300.00	
Maintenance and repair	1,961.22	
Furniture and office equipment	6,071.90	
Total expenditures		524,921.52
Balance, January 1, 1922		28,459.48
Appropriation for construction of a fire-proof vault (Act No. 2786):		
Balance, January 1, 1921		2,016.88
Expenditures		.....
Balance, January 1, 1922		2,016.88
Appropriation for purchase and installation of a still-for-water, Los Baños (Act No. 2898):		
Balance, January 1, 1921		1,475.11
Expenditures		1,474.18
Balance, January 1, 1922		.93
Statement of the Bureau of Forestry appropriation, expenditures and revenues for the fiscal year 1921:		
Appropriation		553,381.00
Revenue		1,013,151.16
Expenditures		524,921.52
Surplus		488,229.64
Percentage of expenditures to revenue		51%

TABLE NO. 9.—*Revenues derived from the sale of forest products and expenditures of the Bureau of Forestry since its organization, April 14, 1900*

Fiscal year.	Revenue.	Expense.	Surplus.	Expenses.
				Per cent.
1901 to 1906[a]	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913[a]	390,664	227,048	163,616	59
1913 (July 1 to December 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
1917	536,328	281,126	255,202	53
1918	650,692	334,254	316,438	51
1919	805,229	473,242	331,986	58
1920	1,009,379	541,488	468,390	54
1921	1,013,151	524,921	488,230	51
Total	9,813,433	5,299,789	4,513,642	54

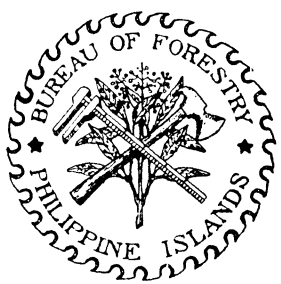
[a] Up to 1913, the fiscal year was from July 1 to June 30.

Philippine Islands. Bureau of Forestry.

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1922



ARTHUR F. FISCHER
Director of Forestry

MANILA
BUREAU OF PRINTING
1923

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY

MANILA, *February 28, 1923*

SIR: I have the honor to submit the Annual Report of the Bureau of Forestry for the fiscal year ending December 31, 1922. The Director wishes to acknowledge the hearty support, loyalty, and effort of the entire personnel of the Bureau of Forestry during the past year.

LEGISLATION

The following bills were submitted through channels, in accordance with the instructions of the Office of the Governor-General:

1. An Act to amend several sections of Act Numbered Twenty-seven hundred and eleven, known as the Revised Administrative Code, and for other purposes. (Section: 130, 226, 1513, 1514, 1816, 1817, 1818, 1820, 1823, 1826, 1828, 1829, 1833, 1835, 1838, 1839, 1841, 2321, 2750, 2751.)
2. An Act repealing Act Numbered Twenty-one hundred and seventy-six and extending to and making applicable to the entire Philippine Islands the provisions of Section Eighteen hundred and thirty-eight of the Administrative Code, regarding pastures.
3. An Act to amend Section eighteen hundred and thirty-four of Act Numbered Twenty-seven hundred and eleven, known as the Revised Administrative Code.
4. An Act to amend Sections eighteen hundred and thirty-nine and eighteen hundred and forty-one of Act Numbered Twenty-seven hundred and eleven, known as the Revised Administrative Code. (Included in Bill No. 1).
5. An Act amending Act Numbered Twenty-five hundred and seventy-eight creating a school of the University of the Philippines known as "The Forest School."
6. An Act to appropriate Five Thousand Pesos for the continuation of the Reforestation of the Talisay–Minglanilla Estate, Talisay, Cebu.
7. An Act to amend Section eighteen hundred and forty of the Administrative Code, extending the term during which timber of lower groups may be cut free of charge,

but only Bill No. 5 (H. B. No. 614) was passed.

PERSONNEL

The personnel during the past year was inadequate due to the general betterment of the lumber and logging business and the request for land classification. The Bureau was unable to obtain the salaries as approved and allowed by the Governor-General during 1920, and the vacant positions were not filled because of the action of the Council of State, making the work much heavier for the remaining personnel. These factors did not aid the morale.

After reductions of personnel due to resignations or economy, the classified force on December 31, 1922, consisted of: One Director, 13 foresters (1 without compensation), 2 assistant foresters (1 in the United States as pensionado), 151 rangers, 7 draftsmen, 43 clerks, and 3 messengers, making a total of 229. The temporary employees were: 2 technical employees (1 without compensation), 1 lumber inspector, 93 forest guards, 6 nurserymen, 7 clerks, 4 draftsmen, 2 watchmen, 1 chauffeur, 1 porter, 5 janitors, 6 carpenters, 2 laboratory helpers, 2 varnishers, and 1 laborer, making a total of 133. The entire force on December 31, was, therefore, 362.

DIVISION OF FOREST MANAGEMENT

POLICY

The policy followed by this Office is to encourage the use of forest lands either for profit, health or for other lawful purposes which may aid the gradual expansion of the country's national industries. The terms under which ordinary licenses, leases, or permits are granted are as liberal as the laws permit. The Bureau has, however, endeavored to prevent people from holding and securing valuable licenses, leases, or permits, etc., as speculative ventures awaiting either the development of the country to make them more valuable or until financial assistance to develop them could be secured. The protection and wise use of the forests, the investigation of the extent of forest resources, inspection of all licenses and the supervisin of the field force are the other most important feature of the work carried out by the division.

PERSONNEL

The regular field and office work of this division has been performed creditably notwithstanding the increased volume of work and of handicaps owing to lack of personnel and money.

At the close of the year there were on the roll of this division the following field and office force: 5 foresters, 4 forest supervisors, 72 rangers, 46 forest guards, and 13 clerks.

TIMBER LICENSES

A drop in the amount of timber cut by the small licensees throughout the Islands has been noticed during the year due to rinderpest, locust campaign, financial depression, overstocked markets, and the keen competition of larger lumber dealers.

During the last quarter of the year just closed, there has been an unusually heavy demand for calantas and marango for local cigar boxes and export trade which shows no sign of decreasing. The supply of calantas is getting scarce with a consequent serious increase in price so that in order to supply the demand for cigar box shooks at a rate which the cigar trade can meet, it is essential that the cigar industry and the producers of calantas coöperate and that the exportation of calantas in other than box form be restricted.

INSPECTION

The inspection of forest stations has revealed the fact that there must be closer supervision of the field personnel.

Problems are continually arising about which the local ranger needs advice. There are also many instances when the local forest officer has followed a policy which was not suitable under the conditions existing in one forest but which was suitable elsewhere. In other words, the Bureau of Forestry is lacking in higher technical personnel needed to solve the problems arising in field work. The rangers have been trained in the routine work and it is not to be expected that they can find the best solution for local problems especially when this solution requires a careful study of a large number of factors which the mass of ordinary work leaves the ranger no time to study even if all the factors involved were recognized. In order to provide this technical advice for the field men it is proposed in 1923 to organize special forest districts with technical men of the forester grade in charge whose duty it will be to coöperate with the rangers and to formulate policies which will be for the best interests of the country. These foresters will also supervise and improve the field work of the men which is something the present inspectors are unable to do for lack of time.

Conditions have been changing so much in recent years that the present Manual of Procedure has been amended by so many circulars that a new manual must be issued as soon as practicable in order to eliminate the present confusion which exists among many forest officers as to what is expected of them.

Circumstances have temporarily placed men in charge of stations who were not fitted for the responsibility. These men are relieved as soon as possible, but the effect on the men and on the service is detrimental. However, as it is not possible to spend money in moving personnel about in order to get the right men to the right place, it will be necessary to leave the supervision of these men to the foresters assigned to the locality. While this will develop the efficiency of the men involved it will leave the forester with less time for his technical duties. By having enough money to permit of the judicious transfer of men, it would be possible to assign experienced men to the important stations with inexperienced subordinates under them.

The inspection of stations has developed the fact that considerable friction exists between the field men and the property clerk. Much of this is unavoidable as the field men requisition supplies for six months' use whereas the property clerk can requisition supplies for only three months and even then is forced to submit to radical reductions by the Emergency Board. The other causes for friction have been investigated and will be eliminated so far as the shortage of clerks will permit.

The technical library in the forest stations has been neglected. Apparently each forest officer retains those bulletins, reports, and pamphlets which he receives. The result is that many stations have but few bulletins or annual reports and these are filed in the bottom of a cupboard or are in a box with old records and are not consulted as often as they should be.

It is also apparent that the average forest officer loses the facility to identify wood after leaving the Forest School because he is seldom called on to use this knowledge.

The rangers had little difficulty in identifying local woods in common use but other species which are not marketed frequently are not as well known as they should be. The proposed pamphlet by Forester Reyes which is in press will enable the forest officers to keep in training.

The following table shows the forest stations throughout the thirteen districts inspected during the year 1922, by the staff of the Manila Office:

District No.	Station	No. of inspections	Date of inspection	Inspected—	Report submitted
1	Aparri	2	October 4–13	Zschokke, Racelis, and Cenabre	1
	Alcala	1	October 4–5	Zschokke	1
	Claveria	2	April 10-13 October 16–18	Zschokke, Racelis, and Cenabre	2
	Echague	1	September 22–24	Zschokke and Racelis	1
	Ilagan	1	October 26–27	Racelis	1
2	Vigan	1	October 22–27	Zschokke and Racelis	1
	Bangued	1	October 23–24	Racelis	1
3	Baguio	None			
4	Dagupan	1	October 25–29	Zschokke and Racelis	1
	Bayombong	1	September 10–12	do	1
	San Quintin	1	October 30–31	do	1
5	Los Baños				
	Calauag	1	November	Gillis	Pending.
	Laguimanoc	1	do	do	Do.
	Mauban				
	Infanta				
	Kabibihan				
6	Naga				
	Mercedes				
	Sorsogon				
7	Iloilo	1	October 30 November 8	Franco	Pending.
	Calivo	1	November 2–6	do	Do.
	Cadiz	1	November 9–11 November 15–16	do	Do.
	Fabrica	1	November 13–14	do	Do.
	Ilog	1	November 19	do	Do.
8	Zamboanga	1	September	Director	
	Cotabato	1	do	do	
	Davao	1	do	do	
	Mati	1	do	do	
	Isabela				
	Jolo	1	do	do	
	Point Flecha	1	do	do	
	Point Holland	1	do	do	
9	Puerto Princesa	1	October	Director	
	Balabac	1	do	do	
10	Tacloban	2	September December	Director and Franco	Pending.
	Catbalogan	1	September	Director	Pending.
	Laoang				
	Masbate				
	Surigao	2	December 18–16	Franco	Pending.
11	Arayat				
	Almacen	1	December 12	Zschokke	1
	Limay	1	December 9–11	do	1
	Masinloc	1	November 22–23	do	1
	Paysawan				
	Subic	1	November 25–26	do	1
12	Calapan				
	San Jose				
13	Cebu	2	September 26	Director	
	Butuan				
	Dumaguete	1	November 22–25	Franco	Pending.
	Dipolog	1	November 27–30 December 1–4	do	Do.
	Cagayan	1	December 5–7	do	
	Total	42			

NOTE.—There were more forest districts and stations inspected in 1922 than in the previous year.

LICENSES

License Statistics.—During the year 1922 there was a decrease of 292 in the number of ordinary timber licenses issued

as compared with 1921, a total of 2,017 being issued during the year. The same is true with ordinary minor product licenses, there being a decrease of 1,061. The decrease was due to the licensees being skeptical of the improvement of the market conditions. They failed to find good markets for their products during the previous years and did not apply for the renewals of their licenses. It should be noted that the bond deposits of those licensees who failed to use 60 per cent of the amount of forest products without justifiable cause were forfeited in favor of the Government.

In regard to gratuitous licenses there was a slight increase, 2,799 being issued in 1921, whereas this year there were 2,871, an increase of 72. In addition to this there were 88 licenses issued this year for building tobacco-curing houses.

There were 11 special licenses issued during the year. These licenses were issued within the Friar Lands Estates the management of which was placed under the Bureau of Forestry. The forest charges collected from holders of these licenses went to the Bureau of Lands.

Bonds.—In accordance with the requirements of the Department Order No. 10 of the Honorable, the Secretary of Agriculture and Natural Resources, ₱4,907.01 were forfeited in favor of the Government, and ₱2,025.77 were refunded. The total amount of bond deposits on hand up to December 31, 1922, was ₱123,293.03.

Tables showing in detail the licenses issued, amount of forest products utilized, and forest charges collected during the year, and a comparison of the totals of each with those of the previous years, will be found in the appendix.

OFFENSES OF LICENSEES

With the present regulations of the Bureau of Internal Revenue, together with those of the Bureau of Forestry, including the new circulars and memoranda, it has been found easier to punish the licensees who attempt to defraud the Government. The most noticeable violation committed by the licensees are the cutting of undersized first group trees and farming out their licenses. The former was due to the tie making industry, and for such offenses the additional forestry charges were collected, while the latter infraction is another way of holding an area for purely speculative purposes, and is usually punished by a heavier penalty, that is, the cancellation of the license and the forfeiture of the bond. Other offenses committed by the licensees are: (1) cutting timber outside of area; (2) transporting

without invoices; (3) falsifying old invoices; (4) wasteful operation in the forest; (5) failure to mark the logs; (6) cutting timber in excess to that specified in the license; and (7) agents not properly authorized.

OFFENSES OF NON-LICENSEES

The following are the offenses committed by non-licensees: (1) cutting timber without license; (2) cutting outside of the communal forest; (3) timber cut under gratuitious license and then used for commercial purposes.

The educational campaign, propaganda and the increased number of inspections of license areas and the more extensive and intensive patrol work of the forest officers, the enforcement of section 1837 of the Administrative Code and closer supervision of cutting areas by the licensees have materially decreased the operation of non-licensees as specified in the preceding paragraph.

SPECIAL PERMITS

There were in all 291 applications for leases or permits and 6 applications for long term license agreements received by this Bureau during the year. The applications received for special uses of forest land fall principally under three distinct classes, viz.: fishpond and saltworks, pastures and residence, with a few special ones as stated in section 1838 of the Administrative Code. The table inserted below shows the status of the applications received and acted upon during the year.

FISHPONDS AND SALTWORKS

The Bureau of Forestry has the control of the operation of the fishponds and saltworks within the mangrove swamps or within public forest land. The monetary returns gained from fishponds and saltworks constructed on areas formerly covered with mangrove forest have been an incentive to other people to apply for permits in tidal swamps, and in many instances encouraged people to begin the construction of fishponds and saltworks without any permit.

In order to protect the mangrove forest, which, if properly conserved, would be a continuous source of firewood, the Bureau issued permits or leases for the construction of fishponds and saltworks with two aims in view; viz, the use of forest land and the protection of the existing forest in the vicinity. In line with this policy the Bureau has allowed the lessees and permittees to exploit, if conditions permit, only an area not exceeding one-half of the territory granted in the lease or permit, and

holds them responsible for the guarding and planting of the rest of the area which must be permanently kept in forest.

As stated in the last year's report, cash bonds were required as a guaranty for the satisfactory compliance with the terms of the lease or permit issued by this Bureau. The depositing of the amount necessary is a prerequisite before the leases or permits are prepared in final form in order to obviate the loss of time and labor spent when, as has happened in previous years, after the agreement had been entered into and duly approved by the Department Head, for some reason or other the applicant no longer desired to continue the lease nor cared to deposit the amount required in the agreement.

The policy laid down by the Bureau regarding cash bonds has not been changed, although pressure has been exerted to secure a radical modification or suspension by the many applicants for fishponds. It has, however, been slightly modified in view of the financial crisis which has prevailed during the post war period. Instead of requiring full cash bonds in advance, this Office has permitted, at the request of interested parties, the payment of the deposit in four instalments payable quarterly beginning with the first instalment when the permit is issued. In this case ordinary fishpond permits are issued, which expire at the end of the fiscal year, or upon the date stated in the lease agreement when finally approved by the Secretary of Agriculture and Natural Resources.

Of the 30 agreements on record as in force 20 fishpond and saltworks leases were cancelled due to failure of applicants to deposit bonds, while 187 applications were either disapproved for the same reason or because more suitable for other purposes or were cancelled by request. There is so far only one lessee who failed to comply with the terms of the lease and whose bond was forfeited in favor of the Government.

There were 95 fishpond and saltworks applications received during the year in addition to the 471 recorded as received in previous years. Only 33 permits were issued during the year as against 14 granted in 1921, in force during 1922. No lease has been issued during the year to those holding fishpond permits, the policy being to have the area under permit inspected and report on improvements made before the long term lease is prepared. This subsequent inspection is necessary in view of the fact that this Bureau desired to have the forest products in a given area fully utilized and the regular charges paid before the exclusive use of the land is contracted for a long term.

PASTURES

Although grazing on forest land has been carried on from time immemorial, steps to control the same have been taken only after the enactment of the Administrative Code in 1917. As stated in last year's report, the collection of data on the effects of grazing within forest land is being continued in order that a definite grazing policy may be promulgated.

There has been a sudden increase of applications for pasture permits filed with this Bureau during the year, there being 108 recorded in addition to the 181 applications on hand at the end of 1921. There were 114 permits issued as against 54 granted in 1921. Fifteen of the permittees either voluntarily had their permits cancelled or were cancelled in view of the applicants' failure to pay the annual rental due.

It is the plan for the coming year to require all cattle owners using forest lands to apply for pasture permits and pay for the rental of the land, if the number of cattle grazed therein exceeds a certain maximum restriction to be determined from the result of the study now being conducted on the subject. If personnel will be available, a man will be specially detailed to report on "The Grazing Industry, Its effects on Philippine Forests," and may devote his time in the different districts of the Islands.

RESIDENCES AND PRIVATE CAMPS

The plan prepared, to check squatting in the forest, in the form of special residence or camp permits is gradually becoming known, and as a result, there has been a decided increase of applications for this purpose. Sixty-five applications had been received during the year as against 7 applications on file at the end of the year 1921. As there is at present a plan to curtail the issuing of caiñgin permits and substituting in its place these special permits, it is felt that the number of applications filed will increase in proportion to the demand of the people during periods of emergency.

CLAIMED LANDS

It will be noticed that some 52 applications are held pending in view of claims on the part of private parties. Mangrove swamps as well as dry public land are claimed as private property in some cases, and until all possible doubts are removed, action on applications is held in abeyance.

Status of special permit applications on December 31, 1922

Class of applications	Received		Total applications December 31, 1922	Applications disapproved		Lease cancelled		Permits cancelled		Issued previous years		Issued 1922		Lease and permits in force	Area in hectares covered by lease and permits in force	Annual rental on lease and permits in force	Pending					Total pending
	Previous years	1922		Previous years	1922	Previous years	1922	Previous years	1922	Lease	Permits	Lease	Permits				Claim	Bond	Rental	Inspection	Issue of permits	
Fishpond	471	95	566	136	187	2	21	.....	.....	8	14	30	33	62	739.0163	₱1,114.50	32	79	....	47	....	158
Saltworks	42	5	47	10	8	....	2	.....	.....	5	2	7	10	22	120.5679	186.00	....	1	....	4	....	5
Pastures	181	108	289	28	22	.....	.....	.....	15	....	54	....	114	108	8,071.5000	4,035.75	18	....	29	24	....	71
Residence	7	65	72	1	9	.....	.....	.....	.....	.....	.....	....	27	27	93.1620	61.00	....	....	31	4	....	35
Sawmill site	5	7	12	.....	.....	.....	.....	.....	.....	3	....	1	1	5	32.7988	52.00	2	....	....	5	....	7
Sanatoria	1	....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	2.0000	2.00	....	.....	.....	.....	.....	.....
Special uses	3	9	12	....	2	.....	.....	.....	.....	.....	.....	.....	2	2	5.2883	10.00	....	.....	.....	8	....	8
Special gratuitous permit	2	2	4	.....	.....	.....	.....	.....	.....	.....	2	....	2	2	.....	.....	....	.....	.....	.....	.....	.....
Total	712	291	1,003	175	228	2	23	....	15	17	72	38	189	229	9,064.3333	5,461.25	52	80	60	92	....	284

Class of applications	Received		Total applications December 31, 1922	Applications disapproved		License agreement cancelled		Issued prvious years		Issued		License agreement in force	Pending			Total pending
	Previous years	1922		Previous years	1922	Previous years	1922	O. M. License	1922	Previous years	1922		Claim	Inspection	Issue of agreement	
Firewood concession	10	1	11	2	.....	.....	1	2	.....	7	.....	6	.....	.....	.....	.....
Nipa and bacauan plantation	50	5	55	1	3	.....	.....	24	.....	.....	.....	.....	27	.....	.....	27
Total	60	6	66	3	3	.....	1	26	.....	7	.....	6	27	.....	.....	27

RENTALS

It will be noted from the above table, that some 1,064 hectares of forest land are occupied with an annual rental of ₱5,460.76 earned during the fiscal year 1922. The collection of annual rental has been made by the Collector of Internal Revenue and the amount collected has not so far been reported.

During the latter part of the year, however, the Secretary of Agriculture and Natural Resources has approved a tentative plan by which rentals will be collected by the Director of Forestry, and this procedure will become effective during the coming year.

COMMUNAL FOREST PASTURES

The requests for reservations to be used exclusively for pasturing cattle of the residents of a municipality have increased. Ten (10) resolutions or petitions from different municipalities were on file at the end of 1922. As the present Forest Law does not provide for the establishment of communal pastures, recommendation has been made for the amendment of section 1839 of the Administrative Code to that effect.

The municipal presidents have, however, been requested to file their applications, if they so desire, for pasture permits under section 1838 of the Administrative Code.

LICENSE AGREEMENTS

Of the 66 applications on hand on December 31, 1922, there were only 5 license agreements granted so far, 26 having been issued ordinary minor product licenses, 6 disapproved, and 27 are under claims. While it has been the policy to replace ordinary minor licenses in mangrove swamps with long term license agreements, it has not been possible to do so in view of lack of personnel.

OTHER SPECIAL USES

The status of other special uses is fully shown in the following table. A very little is known of areas adapted for hotel sites, sanatoria, and bathing establishments, this Bureau has instructed forest officers to be on the lookout during official trips for ideal spots within public forest in their respective districts and to locate the same in their progress map.

CAIÑGINS

CAIÑGIN PERMITS

The demand for caiñgin permits has been far greater this year than at any other time in the history of the Bureau. Some 5,309 permits have been issued as against 2,592 granted

in 1921 or an increase of 2,717 over that of last year. Some 11,395.46 hectares had been cleared under the permits issued, 12 per cent of which are actually covered by applications for homesteads and purchase with the Bureau of Lands. Three basic reasons can be ascribed for the evident increase, viz.: 1. The present business depression; 2. The evident desire of the people to own land; and 3. The policy of the Bureau of Lands to take no action on land applications in regions not as yet declared open for disposition in accordance with the Public Land Law.

It will be noted that while the policy of this Bureau is to grant caiñgin permits only in case of emergency, and as sparingly as circumstances warrant, the causes mentioned were, however, such that it was deemed best for the public interest to act on applications received for the purpose. Great care had, however, been taken to confine the clearings to open or brush land or to lands covered with second growth or non-commercial forests.

This policy seems to be well taken by the forest users as shown by the fact that out of 5,461 applications received, only 152 were disapproved, owing to forest protection requirements.

Caiñgin permits are granted free of charge to applicants. It is, however, proposed to gradually educate forest users to the use of forest land under special permits treated elsewhere in this report.

ILLEGAL CAIÑGINS

With the large number of caiñgin permits issued, there has also been a corresponding increase in the number of illegal cases detected during the year. As against 1,602 cases in 1921, there were 3,110 reported this year or an increase of 1,508 cases. Out of this number, 2,092 were acted upon resulting in the conviction of 430 offenders, acquittal of 35, warnings for 1,537 first offenders and the collection of forest charges from 90 forest law violators, thus leaving 1,018 cases or about 33 per cent still pending for the year 1922. Of the 645 cases pending in the year 1921, there were 235 already acted upon during this year, 150 of which were convicted, 40 acquitted, and the regular and additional forest charges collected in 45 cases, leaving 410 cases still unreported.

The evident increase in the number of cases detected and acted upon was due to the following causes:

1. Increased activity of forest officers in detecting cases.
2. Increased desire of the people to own land.

3. The habit of the people to claim public lands by merely declaring them for taxes.

4. Coöperation of the Provincial Fiscals, Justices of the Peace, and Judges of Courts of First Instance.

5. Present procedure of punishing offenders either administratively or by filing the information against the offenders by forest officers direct with the Justice of the Peace.

While in former years it was the procedure to report caiñgin violations to the Provincial Fiscal, this Bureau has with the sanction of the Bureau of Justice now authorized forest officers to handle the prosecution in all cases which do not involve a total sum of ₱200. In some cases involving sums exceeding this amount, the Provincial Fiscals have authorized the local forest officers to handle the preliminary hearings.

The mandatory provisions of section 2751 of the Administrative Code regarding fines and imprisonment had not been formerly observed by all justices of the peace handling caiñgin cases, as they, in many instances, imposed nominal fines and a few days' imprisonment, if any. The Director of Forestry has, therefore, requested all Judges of First Instance to call the attention of Justices of the Peace under their jurisdiction to the real intent of the law. The majority of them have acceded to the request, and this, fuller understanding of the provisions of the law on the part of the justices of the peace, has contributed to the success of the prosecution by forest officers.

Mention is also made of the active coöperation of the Attorney-General who issued a circular urging Provincial Fiscals to coöperate with forest officers in handling caiñgin cases. The Chief of the Philippine Constabulary has also issued, at our request, another circular directing the Constabulary to coöperate with the district personnel in the Bureau work.

GAME AND FISH

Plans are being made to more fully enforce with the Philippine Constabulary the provisions of Act No. 2590 by virtue of an order from the Secretary of Agriculture and Natural Resources dated August 25, 1922, and approved by the Governor-General on October 17, 1922. In this order the Director of Forestry and the Chief of the Constabulary were appointed as executive officers to enforce the Game and Fish Law, especially that portion which established a close season for game birds and mammals. Data on game and fish will be collected from which detailed instructions to the field men will be formulated for the proper enforcement of the provisions of Act No. 2590.

Status of caiñgin applications acted upon during the period from January 1, to December 31, 1922.

Provinces	Caiñgin agreements	Collective caiñgin permits	Caiñgin permits on—			Area cleared	Approved	Disapproved	Total number of applications received	Remarks
			Public land	Private land	Leased land					
						Hectares				
Abra			113	4		80	117		117	
Agusan			86	2		190	88		88	
Albay			2			4	2		2	
Antique										None.
Bataan			9			12	9		9	
Batanes										None.
Batangas										None.
Bohol			17			6	17		17	
Bukidnon			1			2	1		1	
Bulacan										None.
Cagayan			87	20		254	107	13	120	
Camarines Norte			6			5	6		6	
Camarines Sur			76	80	1	692	157	3	160	
Capiz										None.
Cavite										None.
Cebu			2			2	2		2	
Cotabato			56		1	408	57		57	
Davao		6	371	137	10	3,360	524	8	532	
Ilocos Norte			1				1		1	
Ilocos Sur			92	16		252	108		108	
Iloilo										None.
Isabela			70	1	1	146	72	1	73	
Laguna	252		20			297	272		272	
Lanao			184		1	417	185	16	201	
La Union			133			55	133	3	136	
Leyte			325	14		592	339	10	349	
Marinduque				1		1	1		1	
Masbate			6			8	6		6	
Mindoro			135			294	135	3	138	
Misamis			90	3		136	93	7	100	
Mountain Province			222	1		104	223	13	236	
Nueva Ecija			15			28	15		15	
Nueva Vizcaya			24			38	24		24	
Occidental Negros			85			75	85		85	
Oriental Negros			25	6		61	31		31	
Palawan			434			615	434		434	
Pampanga			13			66	13		13	
Pangasinan			15			49	15		15	
Rizal			534	3		406	537	3	540	

Romblon										None.
Samar			141	15		220	156	9	165	
Sorsogon			5			10	5		5	
Sulu			8			38	8	1	9	
Surigao			206	70		299	276	17	293	
Tarlac										None.
Tayabas			554	48		1,040	602	30	632	
Zambales			73	15		199	88		88	
Zamboanga			240	124	1	199	365	15	380	
Total	252	6	4,476	560	15	11,395	5,309	152	5,461	

Status of illegal caingins reported during the fiscal year from January 1 to December 31, 1922

By provinces	Number of cases	Area cleared	Forest products destroyed						Total forest charges
			First group	Second group	Third group	Fourth group	Firewood	Total	
Abra	74	36.95		2.66	.16	371.65	753.00	1,127.47	₱530.55
Agusan	6	8.00	9.08	18.75	1.26	200.16		229.25	304.29
Albay-Catanduanes	117	66.57	103.44	453.80	1,007.65	1,733.70		3,298.59	5,627.60
Antique									
Bataan	19	6.30		18.20	233.99	681.43		933.62	1,204.01
Batanes									
Batangas									
Bohol	88	31.78	177.27	261.56	239.46	1,458.62		2,136.91	3,606.88
Bukidnon	36	29.90	35.44	68.44	143.14	294.22		541.24	961.02
Bulacan									
Cagayan	41	59.23	197.66	114.48	263.90	723.90		1,299.94	2,583.44
Camarines Norte	16	5.30	60.66	38.85	283.42	217.54		600.47	1,164.23
Camarines Sur	76	18.56	97.83	97.04	596.57	842.63		1,634.07	2,795.04
Capiz	4	4.80	117.52	101.07	68.35	228.70		515.64	1,256.21
Cavite									
Cebu	26	17.48	31.50	168.63	362.55	541.05		1,103.73	1,829.54
Cotabato	1,355	963.00	95.00	1,355.00	15,885.00	33,470.00		50,805.00	69,780.00
Davao									
Ilocos Norte	3	1.88				10.70	60.00	70.70	22.70
Ilocos Sur	48	308.37					18,878.00	18,878.00	3,775.60
Iloilo	20	22.11	5.63	36.89	38.37	225.09		305.98	439.65
Isabela	10	15.75	337.07	120.40	206.94	217.11		881.52	2,677.94
Laguna	10	7.00	5.00	5.06	34.32	198.12		242.50	306.94
Lanao	2	.50			16.68	5.01		21.69	38.37
La Union	2	1.25		82.00		35.00		117.00	281.00
Leyte	122	99.69	172.38	163.48	2,526.25	1,909.09		4,771.20	8,313.73
Manila									
Marinduque									
Masbate	226	261.09	790.11	360.24	4,871.89	3,791.42		9,813.66	18,566.47

Status of illegal caingins reported during the fiscal year from January 1 to December 31, 1922—Continued

By provinces	Number of cases	Area cleared	Forest products						Total forest charges
			First group	Second group	Third group	Fourth group	Firewood	Total	
Mindoro	15	9.68	43.10	43.06	1,220.36	588.56	.....	1,895.08	₱3,373.96
Misamis	24	16.24	35.53	49.29	1,327.86	794.68	.....	2,207.36	3,755.92
Mountain Province	34	1.50	.....	87.00	.....	59.00	.....	146.00	320.00
Nueva Ecija	17	58.75	5.75	322.34	251.65	347.55	.....	927.11	2,096.37
Nueva Vizcaya	1	2.00	8.06	16.25	12.37	42.33	.....	79.01	156.12
Occidental Negros	78	95.54	216.89	498.04	1,415.48	5,601.60	.....	7,732.01	11,011.13
Oriental Negros	10	10.92	13.22	47.83	159.29	280.87	.....	501.21	809.04
Palawan	16	19.00	99.07	122.39	104.02	255.82	.....	581.30	1,326 38
Pampanga	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pangasinan	91	38.08	19.62	147.56	245.81	415.84	45.00	873.83	1,448.20
Rizal	11	12.50	3.99	37.00	69.91	245.81	.....	356.71	516.58
Romblon	41	123.25	1,443.16	1,650.96	3,291.05	3,136.46	.....	9,521.63	21,887.24
Samar	93	86.89	321.32	138.25	2,641.13	5,032.64	.....	8,133.34	12,336.25
Sorsogon	91	84.58	69.81	1,289.81	1,786.54	3,624.63	.....	6,770.79	11,416.19
Sulu	.....	.....	.....	.....	.....	.....	.....	.....	.....
Surigao	32	28.91	50.31	24.81	428.85	816.67	.....	1,320.04	1,997.15
Tarlac	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tayabas	122	135.15	1,767.84	1,072.79	3,697.82	6,308.58	.....	12,847.03	25,541.79
Zambales	63	50.17	75.52	593.04	468.80	1,051.22	.....	2,188.58	4,045.74
Zamboanga	70	64.88	65.47	59.32	1,155.86	1,292.67	.....	2,573.32	4,125.20
Grand total	3,110	2,803.55	6,474.07	9,666.29	45,056.10	77,050.07	19,736.00	157,982.53	232,228.47

By provinces	Number of cases reported to provincial fiscal	Number of cases reported to justice of peace	Number of cases reported to municipal or provincial treasurer	Results of actions taken					
				Pending	Convicted	Acquitted	Collected	Warned	Remarks
Abra	.....	4	70	15	1	1	7	50	.....
Agusan	.....	.....	6	6	.....	.....	.....	.....	.....
Albay-Catanduanes	.....	117	.....	84	33	.....	.....	.....	.....
Antique	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bataan	.....	.....	.....	.....	.....	.....	.....	.....	.....
Batanes	.....	.....	.....	.....	.....	.....	.....	.....	.....
Batangas	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bohol	7	3	78	68	5	.....	15	.....	.....

Bukidnon		3	1	3			1	32	(4)
Bulacan									
Cagayan	1	26	14	17	18		6		
Camarines Norte	1	15		8	8				
Camarines Sur		20	16	57	18		1		(2)
Capiz	4			4					
Cavite									
Cebu	1	21	5	12	8	2	4		
Cotabato								1,355	(3)
Davao									
Ilocos Norte			3	1			2		
Ilocos Sur	1	47		1	44	3			
Iloilo		20		20					
Isabela		10		10					
Laguna		10		10					
Lanao			2				2		
La Union			2	2					
Leyte	1	114	9	47	68	5	2		
Manila									
Marinduque									
Masbate		226		215	10	1			
Mindoro		9		9				6	
Misamis	3	10	5	15	3			6	
Mountain Province			3	2			1	31	(4)
Nueva Ecija	2	15		17					
Nueva Vizcaya		1		1					
Occidental Negros	16	59	3	17	51	10			
Oriental Negros		10		10					
Palawan		12	4	16					
Pampanga									
Pangasinan		58	33	55	2	1	33		
Rizal		11		11					
Romblon	34	7		25	14	2			
Samar	34	49	10	88	3		2		
Sorsogon	5	81	5	29	56	2	4		
Sulu									
Surigao		20	12	12	18	1	1		
Tarlac									
Tayabas	10	76	36	89	21	5	7		
Zambales	3	58	2	36	23	2	2		
Zamboanga	3	28	1	6	26			38	
Grand total	126	1,140	320	1,018	430	35	90	1,537	

[1] The amount of timber destroyed with the corresponding forest charges in 27 cases has not as yet been estimated.
[2] The areas of 65 cases, amount of timber destroyed and the corresponding forest charges on 25 cases were not as yet submitted.
[3] The amount destroyed and the corresponding forest charges of 252 ccases were not given, this being the first offense of non-Christian offenders.
[4] The areas, amount of timber destroyed and the corresponding forest charges of 15 cases were not given, this being the first offense of non-Christian offenders.

SUMMARY OF REPORTS FROM FOREST DISTRICTS

The following are briefs from the annual reports submitted by the officers in charge of districts. Only the most salient features of the work in each district are mentioned in the summary. Many of these reports contain considerable information which is omitted for lack of space.

District No. 1: Headquarters, Aparri, Cagayan.—Provinces: Cagayan, Isabela, and northern portion of Ilocos Norte. Area: 10,155.6 square miles.

Lumber industry has not been good. Toward the end of the year, however, there seemed to be a great demand for lumber with prices ranging from ₱18 to ₱27 per cubic meter. Tindalo and Calantas are capturing high prices, but owing to their scarcity only small quantities can be supplied.

It seems to be the concensus of opinion that Cagayan Province will supply the Ilocos Provinces with most of the timber owing to the dearth of timber in the latter provinces.

The lumbermen in the majority of cases are coöperating with the Bureau of Forestry in wood and plank collection and in detecting forest violations.

Frequent inspection of license areas has resulted not only in detecting forest violations, but also in a better understanding between the licensees and the Bureau of Forestry.

During the year there were few fires that caused appreciable damage.

An important work that was undertaken during the year was the survey of an extensive nipa swamp in the jurisdictions of Sanchez-Mira, Pamplona, Abulug, Ballesteros, Aparri, and Buguey in the Province of Cagayan. The purpose of this reconaissance was to settle once for all as to whether or not these extensive lands belong to the public domain.

The number of timber licenses and those of tobacco curing houses have decreased a good deal, but an increase in the gratuitous licenses has been noted. There has also been a decrease in the number of minor forest product licenses for three reasons: the activity in bakeries has lessened, the baling of tobacco has practically stopped, and cash deposits were required from licensees. The amount of fines collected during the year from licensees is ₱2,719.91 as against ₱2,577.21 of last year and that from non-licensees is ₱4,021.75, due to a more thorough inspection of cutting areas.

The communal forests of Ballesteros, Pamplona, Sanchez-Mira, Claveria, Cagayan, and Bangui, all in Ilocos Norte were temporarily suspended from October, 1922, to June 30, 1923,

because of the typhoon of last September which destroyed much property. This suspension has been extended to the inhabitants of the Cagayan region so that they can utilize fallen timber for the repairs of their houses.

The increase in the number of illegal caiñgins this year is not due to lack of patrol but to the temporary suspension of public land inspection. People, through ignorance of the law and because of the financial depression, have made caiñgins in order to plant temporary crops for their living. The number of caiñgin permits granted this year amounts to 242 as against 43 of last year.

There are two sawmills operating in this district: one in Claveria and the other in Gattaran. The amount of timber scaled for the first mill during the year was 875.48 cubic meters worth ₱899.56. The mill in Gattaran has shipped locally and to Manila 87,562 feet of lumber. The sales of this company this year have decreased considerably below those of last year.

The officer in charge proposes to study grazing in the district inasmuch as the cattle industry is steadily growing and at present there is no data on hand as to how many head can graze on one hectare and there is no knowledge concerning the different forage grasses.

District No. 2: Headquarters, Vigan, Ilocos Sur.—Provinces: Ilocos Norte (except Bangui and Langangan), Ilocos Sur and Abra. Area: 3,588.8 square miles.

The result of inspection of license areas has been gratifying for the reason that forest violation has been to a considerable extent minimized. The wasteful felling and cutting of timber, the making of caiñgins, leaving logs wastefully in the forest, etc., have decreased a good deal. From this inspection the forest officers have had a better chance of becoming acquainted with their district work.

The officer in charge reports that lumbering condition in the district has not been good owing to financial depression. The majority of licensees are coöperating with the Bureau of Forestry to detect forest violations, their attitude toward the Bureau being a friendly one.

The number of timber licenses and that of minor forest products amounts to 214 as against 295 of last year, a decrease of 81. The number of gratuitous licenses has increased. This is due to the apparent increase in the house construction this year.

Contrary to what other forest officers have reported, the free use law in this district has been satisfactory. There was no case of forest violation reported during the year.

No appreciable damage has been caused by forest fires during this year. Only small grass fires have been reported from Abra, Ilocos Norte, and Ilocos Sur. They did not do any appreciable damage to the forest. In connection with this, the officer in charge reports that cogon areas are now being occupied by settlers and those adjoining forested areas are being invaded by parang species such as Duhat, Binayoyo, Acleng-Parang, Aroma, Binunga, Pagsahingin, Balacat, etc., so that in the course of a few years some of these cogon areas are going to disappear and will be replaced by second growth forests, a much more desirable ground cover than cogon.

Caiñgins have been vigorously prosecuted by using the following means of control: frequent talks delivered to the wood-using population; written notices posted on barrio houses; coöperation of the provincial, municipal and barrio officials; frequent patrols by forest officers; and coöperation rendered by licensees. Out of 50 caiñgin cases reported, 40 were convicted, 5 acquitted, and 5 pending trial. The number of caiñgin permits last year exceeded that of this year by 89.

The officer in charge reports also that there are 12 demonstration reforestation plots in the district seven of which were established in 1918, four in 1919, and one in 1920. There are also two forest nurseries. These nurseries are necessary as sources of seedlings for reforestation.

District No. 3: Headquarters, Baguio, Mountain Province.—Subprovinces: Amburayan, Benguet, Bontoc, and Lepanto; and La Union (northern part). Area: 3,419.6 square miles.

Lumber business in this district has been slightly affected by the financial depression as may be noticed from many of the licensees who have been operating quite extensively. The five concessions in this district have cut and manifested 8,023.57 cubic meters up to the month of November of this year.

There was very little activity in lumbering in the Baguio Working Circle during the year as has been reported by the timber licensees. This is for two reasons: the people were busy attending political meetings and they were having financial difficulties throughout the district.

The firewood business in Baguio is on the increase so much that the number of firewood licenses have increased considerably. Baguio needs firewood, especially Camp John Hay. The amount of the invoices submitted during the year is 7,449.73 cubic meters as aginst 10,910.64 cubic meters of last year. The trees used for firewood are being selected and marked. This is

an intensive way of taking care of the firewood supply. There are, besides firewood, 23 other minor forest product licenses. The record shows that 42,333 kilos of lime and sand and 100.92 cubic meters of charcoal were invoiced and manifested this year. There is also a sufficient quantity of firewood in stock for the coming dry season.

The price of Baguio Pine lumber ranges from ₱100 to ₱300 a thousand feet.

The Baguio Working Circle, which has an approximate area of 34,800 hectares of forest land, has been placed under intensive management. Trees are being selected and marked before felling so that sufficient seed trees are left to reproduce cut-over areas. The licensees are required to pile the slash which is either burned or left to rot. Pasture permits have been granted after the areas have been sufficiently reproduced and are safe from damage by cattle. Diameter limit did not work satisfactorily so the marking of trees has been adopted.

Forest fires in this district are a problem. There were several fires which have caused considerable damage, even the loss of lives. One occurred below Camp John Hay early this year in which one soldier died while fighting fire and one Captain of the U. S. Army also died after a night of agony as a result of the burns. Causes of fire: incendiarism and sometimes by hunters.

The district forester reports that there has been established a system of fire outlook posts on vantage points with telephone lines connected with the Central Office where a motorcycle fighting squad of 4 to 8 men is always ready to answer any call. This proved to be satisfactory and the result has been gratifying. In spite of all these precautions, however, fire this year has done considerable damage.

The following shows the number and kind of fires and the damage done to forest growths:

Incendiarism	6
Unknown	36
Forest-grass fire	39
Grass fire	3
Number of seedlings killed due to intentional setting of fire	983
Number of seedlings killed due to unintentional setting of fire	12,277

Illegal caiñgin making is not in any way increasing as the people are now in the habit of going into the Office and ask for caiñgin permits. The number of caiñgin permits granted this

year amounts to 399 and that of illegal caiñgins, 77, of which 3 have been dismissed as being the first offense.

As a result of the opinion rendered by the Attorney-General in regard to grazing, the district has authority now to grant special permits for pasture lands so that cattle owners, instead of going to the Provincial Treasurer, have to approach forest officers for permits.

A forest station has been recommended to be established in Bontoc as it is important for the information of the people there. The district forester reports that the district needs more personnel if fire hazard is intended to be minimized.

District No. 4: Headquarters, Dagupan, Pangasinan.—Provinces: Nueva Ecija, Nueva Vizcaya, Pangasinan, Tarlac, and La Union (southern part). Area: 8,718 square miles.

Lumbering industry throughout the district has been dull. Due to the bond requirements coupled with existing business conditions, there has been a decrease of timber licenses as compared with the total granted last year. Although the total of minor forest product licenses has been decreased there has been a good demand for firewood, camanchile bark, tanbark, buri leaves, and rattan. The manufacture of cart-wheels has been given proper impulse owing to the fact that the greater bulk of merchandise for the market is still transported by carreton (cart).

A closer coöperation of licenses and lumbermen has been secured. Many licensees reported caiñgin makers and other infractors from their respective areas as a result of talks of forest officers.

In spite of the friendly attitude of lumbermen and licensees towards forest officers and their willingness to coöperate with this Bureau, many violations have been detected, most of these are the cutting of undersized trees, invoicing timber secured outside of areas, transporting timber without invoice, and abandoning merchantable logs. Timber cut under the free use law for private use is afterwards sold or bartered for other commodities.

No individual forest fires have been reported that did considerable damage to forest trees. Cogon fires are common in open regions usually started by hunters and owners of cattle.

District No. 5: Headquarters, Los Baños, Laguna.—Provinces: Batangas, Laguna, Marinduque, and Tayabas. Area: 6,184.9 square miles.

Little headway has been made in lumbering during the year for two reasons: the financial depression throughout the dis-

trict and the past election that made people prefer to attend political meetings rather than to chop wood.

The silvicultural condition throughout the district remains unchanged, except that about 6 kilometers east of Paete, Laguna, a good reproduction of Tiaong, Mayapis, and Dalindingan has been reported.

No forest fires have been reported during this year.

The District Forester made a recommendation in regard to making isolated mountain regions in Batangas and Tayabas forest reserves and on account of its importance it has been quoted as follows.:

"It is recommended that isolated mountain ranges in Batangas and Tayabas be surveyed and reserved promptly because coffee growing is being undertaken and this will mean extensive encroachment on the forest in the very near future. Mt. Batulao will be partly taken care of in Balayan Cadastral No. 4 but the other, Mt. Maculot on the shore of lake Mabanbon, Mt. Lobo, and Mt. Malapuño or Malaraya need attention."

The number of timber licenses and minor forest product licenses has decreased quite a good deal for two reasons: the the requirement of a cash deposit and the financial depression coupled with the dull market condition throughout the district. There is also a big decrease in the number of licenses inspected because of the shortage in personnel. The amount of forest violation committed by licensees and non-licensees amounts to ₱4,071.54, of which ₱617.16 have already been collected.

There are 91 caiñgin cases covering an area of 89 hectares, the amount of timber destroyed being 6,636.84 cubic meters. The forest charges amount to ₱12,952.67 of which ₱808.19 have already been collected, there remain ₱11,682.54 pending collection. The number of caiñgin permits granted during the year is 513, the area being 770.86 hectares.

Only two sawmills are operating in the district: The Filipinas Lumber Company and the Gotauco Lumber Company, the capacity of each being 30,000 and 25,000 feet a day, respectively.

District No. 6: Headquarters, Naga, Camarines Sur.—Provinces: Camarines Norte, Camarines Sur, Albay, Sorsogon, and Catanduanes. Area: 6,665.5 square miles.

The big licensees in this district were particularly fortunate this year inasmuch as they have been operating even during the time of financial depression. The small licensees, however, were those who have been affected the most.

Cross ties seemed to be the order of the day. There have been several contracts made by the sawmill owners with the

Manila Railroad Company, the Manila Electric and Light Company, and the Sugar Centrals of Iloilo and Negros in order to supply these companies with ties. Considerable difficulty, however, has been encountered by the licensees in regard to their capital invested. They had to depend a good deal on their agents, who may not be acting in good faith. Another difficulty is that the Chinese, who are agents of these licensees, are exacting between 25 per cent and 30 per cent on the commercial and official invoices, which is unfair. It is hoped that something may be done to correct this irregularity.

The number of timber licenses this year is 165 as against 163 of last year. During this year 12 licenses were cancelled either for nonuse or for farming licenses. However, the number of minor forest product licenses has decreased considerably. The number of violations by licensees amounts to 35 with the corresponding charges of ₱4,313.33 compared to 73 which amount to ₱4,168.79, of last year. The result of frequent inspection of cutting areas by forest officers has been generally satisfactory.

The forest surveys made during the year were more than a mere taking of trail notes. There was a compartment survey undertaken.

The officer in charge believes that the discontinuance of public land examination has resulted in detriment to the applicants inasmuch as he has found that these people regard the public land law as inimical to their welfare.

The number of violations by non-licensees amounts to 112 with the corresponding charges of ₱2,117.38 as against 242 cases amounting to ₱7,688.87 of last year, a considerable decrease.

A more vigorous policy was adopted this year in prosecuting caiñgin making. There have been reported 321 cases of caiñgin with timber destroyed amounting to 10,582.12 cubic meters, the forest charges and recharges being ₱22,273.41. The amount collected being ₱10,896.84 and ₱11,419.29 pending collection.

Caiñgin makers are becoming difficult to convict inasmuch as they are availing themselves of the services of either lawyers or "procuradores judiciales." The number of caiñgin permits granted this year amounts to 119 with an area of 651.6 hectares as against 22 caiñgin permits granted last year.

The system adopted by this Office in handling caiñgin cases has been quite satisfactory. The rangers are witnesses no more but they are officers of the Government who have the authority to prosecute. The following interesting outline prepared by the officer in charge of District No. 6, which serves as a guide

for the forest officers in prosecuting caiñgin-makers, is herewith quoted:

I.—The Public Land Act No. 2874. Chapter III

(*a*) Section 11. Public lands suitable for agriculture can be disposed of only as follows:

(1) For homestead settlement.
(2) By sale.
(3) By lease.
(4) By confirmation of imperfect or incomplete titles:
(*a*) By administrative legalization.
1. Homestead.
2. Sale.
3. Lease.
4. Free patents.
(b) By Judicial legalization.
1. Real.
2. Composición con el Estado.
3. Información posesoria.
4. Purchase from the Spanish sovereignty under the laws and royal decrees then in force.

II.—*Land Tax Receipts*

According to the decision of the Supreme Court these are not evidence of title.

(*a*) Volume VII, Philippine Reports, p. 609, Evangelista *vs.* Tabayuyong "Tax receipts are not evidence of title to land, unsupported by other proper proofs." March 5, 1907.

(*b*) Volume IX, Philippine Reports, p. 563, Casimiro *vs* Fernandez. The "The payment of taxes on the land by plaintiff, cutting timber thereon, and keeping off trespassers, does not constitute possession but were merely acts of ownership tending to show that he claimed to own it."

Occupancy, paying of land tax, nor document of purchase or other documents pertaining to private transactions will not be recognized as title of ownership to forests.

Contracts of other documents of purchase transacted by private persons confirm only the act of commercial exchange but they are not legal documents of land ownership.

III.—*The Forest Regulations. Section 12*

(*a*) Clearing by fire of grass and brush lands in public forests will be permitted only under written permission by a forest officer upon proper application.

(*b*) Owners of private woodlands are permitted to make caiñgin in their alleged lands only upon written permission of a forest officer upon proper application.

(*c*) Caiñgin made not in accordance with the above regulation are, therefore, illegal and punishable by law.

The annual rental of the different special permits in the district amounts to ₱533.50 covering an area of 1,067 hectares.

There are seven sawmills in the district, most of them have already been reported in previous annual reports. The total number of cubic meters cut this year is 19,366.17, the forest charges being ₱20,334.32. A comparison of the number of cubic meters of timber cut with its forest charges is shown as follows:

Year	Volume in cubic meter	Forest charges
1921	17,433.88	₱17,831.43
1922	19,366.17	20,334.32

There were 5 forest zones established during the year: one in Labo, Camarines Norte; 3 in Catabangan and Tinambac, Camarines Sur; and one in Bulusan, Sorsogon, by the classification party from Manila.

The officer in charge reports that there are several points of interest in his district; one of which is the Lanot Mineral Spring, located on San Miguel Bay, Daet, Camarines Norte. The water in this spring is said to be medicinal. During the months from April to June every year, many people from the different parts of the Bicol region spend their vacation in that place. Another place is the Tiwi Hot Springs, located in Barrio Naga, Tiwi, Albay. The water contains sulphur and is said to be medicinal. Many people spend their vacation here during the dry season.

District No. 7; Headquarters, Cadiz, Occidental Negros.—Provinces: Antique, Capiz, Iloilo, and Occidental Negros. Area: 8,332.9 square miles.

About 75 per cent timber and firewood licensees this year failed to cut 60 per cent of the amount stipulated in their licenses and approximately 30 per cent of these licensees did not cut any. The reason for this are: the small amount of money in circulation, the low price of timber, and small demand.

Firewood has had a good price ranging as much as from ₱30 to ₱50 a cubic meter. The market for dye-wood has been good. The price per picul being ₱1. It has reached, however, as high as ₱1.40 but this did not last long. Market for guano has been quite steady. The price in Iloilo ranges as high as ₱20 to ₱25 a ton. There was no market this year for other minor forest products as rattan, almaciga, charcoal, etc., inasmuch as these products did not command good prices.

The number of timber licenses and of minor forest products decreased a good deal this year. However, it is gratifying to note that the amount of collection from licenses as fines has

reached the sum of ₱11,275.07, of which ₱5,030.33 have already been collected and ₱6,244.74 pending collection. From non-licensees the amount to be collected was ₱6,364.82, of which ₱588.72 have already been collected, there remaining ₱5,776.10 also pending collection. The reasons for having better collections this year was the active coöperation of the municipal and provincial treasurers. Furthermore, the procedure which was adopted by the Bureau by indorsing the order of collection direct to the municipal treasurer has proven to be effective.

It is recommended that the status of the mangrove swamps in Iloilo Province be determined. Instead of the municipalities controlling these mangroves, the Bureau of Forestry should control them as their management will be easier.

On account of some people not being well-informed as to the benefit to be derived from the communal forests they have applied for licenses to cut lower group timber.

There are four sawmills in this district, two of which are among the largest in the Islands and are operating under long-term agreements.

The establishment of forest zones has been beneficial to some barrio people as it is believed that through the effort of the local forest officers those people whose houses are located inside the Forest Zone have already signified their willingness to transfer their houses to the agricultural zones.

The forest station at Iloilo was closed on November 10. The headquarters now are in Cadiz, Negros Occidental.

District No. 8: Headquarters, Zamboanga, Zamboanga.—Provinces: Cotabato, Davao, Jolo, Zamboanga (except Dapitan and Dipolog), and southern Lanao. Area: 22,576 square miles.

Logging by donkey engines or tractors has been abandoned for two reasons: poor market and lack of capital.

It is gratifying to note that inspections of license areas have been satisfactory. Big and small licensees are fast realizing the importance of guarding against the wasteful felling and cutting of timber.

According to report, gutta-percha, tanbark, almaciga, and other resins are wastefully being extracted without any regard to their great economic value. Means to prevent wasteful extraction are now on foot.

No forest fire of any importance occurred during the year. Small cogon fires were common throughout the district.

There were two forest reconnaissance made during the year: one in Basilan Island and the other in the Hercules Lumber Company tract in Zamboanga.

Timber licenses have decreased this year, there being only 90 licenses as against 121 of last year. This decrease is due to poor markets and to the requirement of a forestry bond designed to guarantee the cutting of at least 60 per cent of the amount granted in the license. The number of minor forest product licenses amounts to 137 as against 373 of last year, a considerable decrease.

Although there has been little activity among the small licensees owing to small demand for lumber, there seemed to be a big demand for posts and cross-ties. The Philippine Sugar Central Agency had an order of 60,000 ties.

This year the district paid considerable attention to the collection of forest charges, but it has been noted that there was a considerable decrease; as low as 30 per cent. The reason for this is the poor market conditions and the lack of a sufficient number of men.

The officer in charge reports that there is a good market for almaciga in Singapore, the amount of 27,000 kilos amounting to ₱3,542.70 has been exported. Gutta-percha, beeswax, and tanbark are being extracted quite extensively.

There are thirteen sawmills in the district cutting from 1,000 to 20,000 feet a day. The lumber was shipped chiefly to Manila and to foreign ports.

The number of caiñgin permits granted this year is 653.

The officer in charge reports that illegal caiñgins may be minimized by increasing the number of personnel; establishing forest zones; publicity; coöperation of the municipal, provincial, and other officials of the Government; and by legislation.

A vinta (a Moro banca) is indispensable in a Moro household. A Moro generally lives on the sea coast and needs a vinta for his daily use. Inasmuch as the making of vintas is becoming quite an industry in the Moro region, the officer in charge suggests that the people there should be encouraged to secure licenses. Only one responsible Moro should, however, be given license in one locality and other Moros wishing to cut timber should be held accountable to the one who has the license.

The status of the Teak Reserve at Jolo should be more definitely stated and proper regulations made for purpose of protection. The officer in charge also recommends that Mount Apo in Davao and Cotabato should be reserved for the same reason.

There have been 8,305 board feet of lumber donated by the Basilan Lumber Company and given to the Bureau of Forestry for mechanical test in the Bureau of Science.

Lumber inspection has been carried on more in detail this year than it was last year. There were inspected and graded for the Port Banga Lumber Company 332,707 board feet of lumber shipped to Manila. There were inspected and identified for Mr. Ong Tiam Teng of Jolo 4,632 ties (81,060 board feet) to be shipped to the Philippine Sugar Central Agency at Iloilo and 54,000 ties (915,840 board feet) for the Tonquil Timber Corporation at Jolo.

Hunting deer is becoming so notorious in this district that more strict rules and regulations should be promulgated for proper protection. The officer in charge reports that Mr. Neibert, manager of the Milbuk Timber Corporation at Milbuk, Cotabato, has issued orders to his men that no more than two deer a week should be killed.

District No. 9: Headquarters, Puerto Princesa, Palawan.—Province, Palawan. Area: 5,617 square miles.

Although there was little progress in lumbering during the year, the licensees have been able to maintain logging operation. Toward the end of the year, however, lumbering business showed quite an increase. Several boats from Manila have been calling at the different ports in this district for lumber.

There is nothing that can be said of the lumbermen in regard to their attitude toward the Bureau of Forestry because they are all coöperating, except, of course, a few who are naturally antagonistic. Even at this the officer in charge is optimistic as to the way these people are behaving now.

The amount of timber cut by the licensees in this district during the year is roughly estimated to be over 10 million board feet of first group timber. The market value at ₱42 per cubic meter (estimated) is ₱1,012,158 and the approximate forest charges being ₱40,247.98. About 30 per cent to 40 per cent of this amount cut is still in the forest awaiting better prices.

The district, besides having a good stand of commercial forest, has an extensive mangrove swamp containing excellent stands of bacauan, tangal, nigue, and langaray. It is reported that these mangroves are still virgin.

There were only two timber reconnaissances made in this district during the year by members from the Manila Office.

There has been an increase in the number of small timber licensees this year. Among the big licensees, however, the increase has been small. More than 50 per cent decrease in the number of minor forest product licenses has been noted. This is for two rasons; poor market conditions and the requirement of cash a deposit.

The cañgins were not so serious as they might be. The non-Christian inhabitants are those who have been making most of the caiñgins in the district. This is due partly to the policy of the ex-deputy governor to concentrate the non-Christian inhabitants in places along the coast so as to form settlements. He required them to clear patches of forest along the coast sufficiently big for their plantation in order to plant coconuts. Another thing is the order of the Governor-General to make gardens and plant agricultural crops.

The officer in charge is pessimistic as to the way the non-Christian inhabitants caught committing forest violation have been treated. They are pardoned upon the first offense which gives them a big leeway to evade the law. He wants to place them on an equal footing among their Christian brothers before the law for in only this way can the forest act and regulations be enforced.

The greatest number of caiñgins made during the year was in the municipality of Coron perhaps because of the closing of the forest station there. Since then inspection has been rather seldom thus giving the people a chance to make forest destruction.

The number of caiñgin permits granted this year is 437 covering an area of 799.35 hectares.

Owing to the big number of non-Christian inhabitants caiñgin-making was no uncommon thing especially during the time when the lumbering business was in a bad condition.

A land classification party arrived in this district on December 23, 1922, for the purpose of surveying and classifying the land in Palawan.

On account of the difficulty of transportation from one island to another, it has been recommended that the forest station be furnished with a motor boat.

The number of auxiliary invoices submitted against licensees and non-licensees amounts to ₱4,495.10 as against ₱1,649.41 of the previous year. The number of illegal caiñgins submitted is ₱1,877.95 compared to ₱440.12 of last year.

District No. 10: Headquarters, Tacloban, Leyte.—Provinces: Samar, Leyte (eastern part), Surigao, and Masbate, Area: 11,124.2 square miles.

Owing to business depression and to some other unavoidable causes, four sawmills did not operate during the year; namely, the Kinamaligan in Masbate, the Calbayog Sawmill, the Leyte Sawmill at Babatñgon, Leyte, and the sawmill at Catarman. The market, however, was steady during the year, as may be

seen from the sale of timber by the sawmills in this district which amounts to 1,717,326 board feet as against 1,043,806 board feet of last year. Firewood was transported in large amounts to Manila. Local demand in Surigao was quite steady. Since Masbate has to depend a good deal upon foreign markets, lumber business in this section of the country is practically nil. The market in Samar, however, is at a standstill inasmuch as lumber has been used for local consumption.

Inspection of cutting areas has been quite extensive. Minor forest product license areas were also inspected this year and the result has been gratifying.

The number of timber licenses this year amounts to 324 compared to 361 of last year. Minor forest product licenses number 220 as against 255 of the previous year. The present system of inspecting cutting areas is rather crude and wasteful since there is no way by which the timber cut can be checked.

The auxiliary invoices submitted by forest officers during the year amount to ₱11,537.61.

The number of leases of forest lands is increasing; for pasture permits being 14; for fishpond 1; for sawmill site 1; and for residential site 1.

No forest fires of any considerable importance occurred during the year. Only small cogon fire of small magnitude were reported. The cause of fires in Masbate is incendiarism.

There was only one extensive survey made during the year and, that is, the laying out of a proposed forest reserve in Northern Masbate. A report and a sketch have already been submitted.

Caiñgins are increasing, there being 707 granted this year as against 413 of the previous year. Unauthorized caiñgins have also increased quite a good deal due to the famine which had been threatening this district for some time. Many applications for caiñgin permits have been received, the number being 741 this year as compared to 501 of the previous year. The tendency of the people to take up farming has resulted in the destruction of valuable forest lands.

Patrol was quite extensive this year, practically all the places in this district have been covered by the personnel of this district.

The number of sawmills remains the same as that of last year, there being 13 all told, and the amount of lumber scaled being 5,850.34 cubic meters amounting to ₱6,027.72. There have been submitted 13 reports on sawmills which give more in detail the description and the improvement of the mills.

District No. 11: Headquarters, Manila.—Provinces: Bataan, Bulacan, Cavite, Pampanga, Rizal, and Zambales. Area: 5,106.1 square miles.

Lumbering condition was at a standstill in this district during the year except in the eastern part of Bataan where the demand for bancas has been considerable. There was quite a large shipment of gogo, rattan, and buri during the year.

Only one sawmill of the four located in the district maintained a fairly active operation during the year.

Fires which occurred in this district have been caused by railroad locomotives. Cogon fires occurred only during the dry season without any considerable damage to forests.

There has been a decrease in timber licenses this year, the number being 116 as against 232 of the previous year. There were 171 licenses for minor forest products as against 270 of last year. A considerable increase has also been noted in the gratuitous license granted this year, there being only 145 compared with 105 of last year.

The report of the forest officer in charge shows that there were 571 cases of illegal cutters, the amount being ₱7,455.15 as against ₱9,062.68 of last year. There were also 245 licensees who have paid the forest charges of ₱4,035.11 as against ₱5,927.07 of the previous year. This apparent decrease has been due to two causes: business depression and informal talks by forest officers on their official trips.

The number of caiñgin permits this year amounts to 426. Of the 46 illegal caiñgins reported by the officer in charge, 38 have been convicted and 6 acquitted.

It has been recommended by the officer in charge that desirable commercial species on the areas logged over should be planted so as to insure future supply of good timber species.

District No. 12: Headquarters, Calapan, Mindoro.—Province: Mindoro. Area: 3,981.6 square miles.

Lumber markets throughout the district have been weak especially in Sablayan. Prices of timber have dropped off to 50 per cent except those of firewood. People who own boats have been rather active in their logging operation even though the price of lumber has gone down.

According to reports, excellent stand of timber may be found in the eastern part of Naujan and Pola; in the northern parts of Puerto Galera and Paluan; and in some parts of the jurisdiction of Abra de Ilog. Timbers of the first group are quite abundant in these places, especially species of Calantas.

The officer in charge reports that there are pine trees growing on cogon lands between Humalili or Caratong River and Bato River in the mountains of Caaranan and Balatican with an area of approximately 500 hectares.

He recommends that if funds be available, a forest experiment station near this place be established so as to take care of the pine trees in this section of the country as in time they will perhaps disappear on account of frequent fires.

It has been found that ebony and molave are abundant in the islands of Lubang, Gulo, and Ambil, although the existing forest there now forms a small percentage of the total area of these islands.

The officer in charge reports that frequently homesteads which have been approved are turned into grazing lands. Cattle owners are not interested in farm crops. They are interested in converting them all into pastures. In order to secure good forage, they have burned the areas covered with cogon and the result was that extensive cogon areas are now in sight used for grazing purposes.

The number of timber licenses in force during the year is 73, 3 having been cancelled. The minor forest product licenses number 166 and that for gratuitous licenses 32.

Caiñgin-making is decreasing in this district owing to frequent patrols. In some places, however, caiñgin making is still on the increase. The amount of 286.64 cubic meters have been cut during this year worth ₱643.05. There were 135 caiñgin permits issued this year. Caiñgin and trail posters have been placed in conspicuous places.

There were three special permits granted this year, all for pasture purposes.

The forest charges against licensees are ₱93.96 and ₱238.09 against non-licensees. For caiñgins the amount collected has been ₱1,377.63.

District No. 13: Headquarters, Cebu, Cebu.—Provinces: Agusan, Bohol, Bukidnon, Cebu, Lanao (northern part), Leyte (western part), Misamis, Negros Oriental, and Zamboanga (northern part). Area: 20,531 square miles.

The Kolambugan Lumber and Development Company has been closed and work on the Butuan Mill has practically stopped. Only the Cagayan Sawmill Lumber Company and the Misamis Lumber Company are those that kept operating throughout the year, for the reason that they have been cutting on a small scale to meet local demand. Big lumber dealers in Cebu

have been particularly fortunate inasmuch as they sold this year at a profit 30 per cent more than last year. The reason for this is the fact that the majority of small licenses in Cebu have stopped cutting timber thus leaving logging operation in the hands of the big lumber dealers.

Practically all the licenses are coöperating with the Bureau of Forestry.

Owing to the destruction of many excellent timber trees in Bohol because of hunting flying lemur and cutting of camagon, the officer in charge recommends that there should be cutting rules in the license to the effect that hunting "Caguang" (flying lemur) and cutting "Ituman" (camagon) should be prohibited.

The way some people in Cebu and Negros Oriental use to drive or kill the locusts was to burn cogon lands. Sometimes this is dangerous especially in places adjoining Bureau of Forestry plantations. The Bureau of Forestry plantation in Talisay-Minglanilla Forest Reserve has always been in danger of forest fire. In fact there were several fires this year which have destroyed many seedlings of baguilumbang and ipilipil. It is hoped, however, that something can be done to stop this bad practice of setting fire without regard to forest plantations.

The land which is now being classified in the Province of Agusan, Mindanao, during the months of August and September will doubtless remove the misunderstanding between the Bureau Forestry and the Bureau of Labor as the latter is responsible for the coming of the people emigrating to that section of the country.

There has been a decrease in timber licenses this year, the number being 175 as against 178 of last year. There is, however, a big increase in the number of gratuitous licenses this year, the number being 1,430 as compared to 1,235 of the previous year. Another decrease has been noticed in the number of forest product licenses, there being 364 this year as against 438 of last year.

There is a bright prospect for fishpond and saltwork industry in Cebu so much so that there are now 92 pending applications for examination.

Several municipalities especially Hindang in Leyte have passed an ordinance providing for the strict compliance of the Forest Law and Regulations. This is a good ordinance for the reason that they are fast realizing that there is a dearth of timber in that part of the country.

In connection with caiñgin cases this year, the officer in charge has attributed forest destruction to the following causes: General depression in price of abaca, maguey, and coconuts; insufficiency of law pertaining to caiñgin (forest destruction); the practice of some people in selling clearings which have become almost second growth; the ignorance of the law; and the objectionable practice of some people to make "patiway." This is a clearing made in a forested land adjoining a body of timber in order to keep wild hogs and monkeys from entering the land cleared and owned by them. It is also attributed to the decision rendered by the Supreme Court of the Philippine Islands in the case of T. A. Ankron *vs.* the Government of the Philippine Islands in which it gives the people a big leeway to evade the law.

The collection made this year from licensees as fines amounts to ₱3,700 and from non-licensees, ₱1,690.46.

DIVISION OF INVESTIGATION

1. RECONNAISSANCE

No reconnaissance was conducted by this Division outside of the Makiling National Botanic Garden, as it was deemed best to concentrate the work here in order to finish this recconaissance as quickly as possible. In 1921, the Makiling National Botanic Garden was divided into eight blocks, and the reconnaissance on four blocks, was finished that year. This year, the remaining four blocks were finished, thus completing the reconnaissance on the Makiling National Botanic Garden proper. This work was done by the class of 1923 during the months of April and May. Complete maps have been made and stand tables and stock tables for each block are almost finished. The work in this reconnaissance was under the direction of Ranger Carlos Sulit assisted by Rangers Felipe Salvoza, Justino Seguerra, and Mamerto D. Sulit; also Forest Guards Florentino Canicosa and Felix Columbres.

A brief description of the four blocks mapped and estimated this year follows:

(*a*) *Dampalit Block.*—This block is bounded on the north by the Forest Reserve boundary, on the east by the Military Reservation, on the south by the Calamba Estate patrol trail, and on the west by the Calamba-Los Baños municipal boundary.

The topography, in general, is rugged, composed of a series of ridges with steep slopes and deep gulleys between them. Many cliffs, one or two of which are impassable, were en-

countered. Several creeks are found in the block, but with the exception of one or two, they are dry except during the rainy season. The logging trails present are very steep, making it exceptionally hard for the carabao to haul timber.

The area of the Dampalit Block is approximately 344.38 hectares, divided according to vegetation as follows:

	Hectares
Commercial forest	244.41
Commercial mid-mountain forest	5.44
Non-commercial forest	18.69
Cogon and open land	66.99
Authorized caiñgin	8.85

The lower portion of the northern side is partly covered with cogon and climbing bamboos. The cogon part is being used for pasture and one permit, in Sitio Guyonganan, is at present issued to Mr. Nicasio Villegas of Los Baños, Laguna. Several caiñgins under contract are also found in the area.

The stand of timber is very good, several desirable species having been recorded. Minor forest products, especially rattan and vines for tying, are also abundant. The stand per hectare is approximately 93.40 cubic meters.

(*b*) *Dipangla Block.*—This block is situated within the jurisdiction of the municipality of Sto. Tomas, Batangas, and is bounded on the north by the Calamba Estate boundary, on the east by the Latag trail, on the south and west by the Reserve boundary.

The area of the Dipangla Block is approximately 491.71 hectares, divided according to vegetation as follows:

	Hectares
Commercial forest	132.93
Commercial mid-mountain forest	6.64
Non-commercial forest	133.58
Non-commercial mid-mountain forest	143.11
Non-commercial mossy forest	55.34
Cogon and open land	15.78
Authorized caiñgins	4.38

Of all the eight blocks, in the entire National Botanic Garden, this is the roughest, being broken by a series of creeks running almost parallel and separated from each other by knife-like ridges, broken here and there by several peaks. The banks of the creeks are steep, and in some instances they are entirely devoid of vegetation. An area just below the peak is very level and, according to information, was the camping site of General Malvar during the insurrection. The vegetation in this spot is second growth, having been caiñgined during that time. A great deal of the area, especially the higher elevations, is covered with

non-commercial mossy forest, while the lower portion shows evidences of having been cultivated in the past, in spite of the extremely rough topography. The stand, in general, is very poor although good patches can be found, once in a while, in the middle portion. However, topography makes the utilization difficult. The block, therefore, is unsuited for commercial exploitation and should be reserved as a protection forest. The stand per hectare is approximately 47.91 cubic meters.

(*c*) *Summit Block.*—This block is bounded on the north by Molawin Creek and Molawin Horse trail, on the east by the Solokin Block, on the south by the Forest Reserve boundary, and on the west by the Dipangla Block. The area of the Summit Block is approximately 561.45 hectares divided according to vegetation as follows:

	Hectares
Commercial forest	352.45
Non-commercial forest	51.12
Non-commercial mid-mountain forest	104.34
Non-commercial mossy forest	43.84
Cogon and open land	4.23
Authorized caingins	4.56
Non-commercial forest with climbing bamboos	.91

It is also very rough in topography although not as much as the Dipangla Block. The two principal creeks draining the area are the Nagtalaok and the Malalim na Sanog, both of which are intermittent. These two creeks have almost perpendicular banks in certain places. Several peaks are also found on the area and several impassable precipices were encountered.

The lower portion contains good stands of timber which are accessible, being very near the Solokin Block. The upper portion, however, due to the extremely rough topography, cannot be exploited at all. Moreover, the trees are mostly poor species. Rattan is very abundant in this area. The stand per hectare is approximately 88.77 cubic meters. The lower portion near the Forest Reserve boundary is under legal caingin.

(*d*) *Solokin Block.*—The Solokin Block is the largest of all the blocks and is bounded on the north by the Solokin Creek and Molawin Loop trail; on the east and south by the Forest Reserve boundary; and on the west by the Summit Block. The area is approximately 710.81 hectares distributed as follows:

	Hectares
Commercial forest	602.53
Non-commercial forest	52.84
Non-commercial forest with climbing bamboos	10.81
Cogon and open land	21.36
Authorized caingin	23.27

This block is comparatively level and with the exception of the Solokin Creek, which is known as Cambontok on the lower part, all of the streams in this area are intermittent.

A great deal of the area is covered with commercial forest, the average stand of which is approximately 133.92 cubic meters. The presence of logging trails on nearly all the ridges and valleys shows that the area is very accessible. The trails are so numerous that they form a network, bewildering to one who has only been in the area for a short time. A great deal of the land between Mount Bulalo and Wakwa Creek is agricultural and is being cultivated at present. A barrio, known as Santa Cruz, was found in this place, but due to the fact that the people have been informed that the land is inalienable, most of them have moved away. Many plantings of lumbang, coconut, and other permanent agricultural crops are found in this area. Two big white earth deposits are located in this block, one being very near Monument No. 10 and the other, about 500 meters from it inside the forest.

The same method of mapping and timber estimating, as was used in the 1921 reconnaissance, was also used this year. Likewise, the scale of the maps (1–5000) and the contour interval (10 meters) is the same.

The only remaining area, adjacent to the Makiling National Botanic Garden proper, which has not been gone over and which is public land, is the Calamba Estate addition, and a reconnaissance is planned for this during 1923. This area will be gone over very carefully in order to determine that part of it which is forest land and that which is agricultural. It is recommended that that portion of the Calamba Estate which is found to be forest land should be finally included, by proclamation, as a portion of the Botanic Garden.

The result of the Makiling reconnaissance will be submitted early in 1923. No report of this was made in 1922, as it was thought better to wait until the entire project is completed and then make a complete report.

The class of 1923 did excellent work in this reconnaissance and covered a larger area than that gone over in the previous year. The rangers in charge of the field work showed exceptional ability and Ranger Carlos Sulit was particularly efficient.

2. DENDROLOGY

In addition to the regular instruction in this subject the following work has been done, mainly by the rangers in charge of the field work:

(*a*) A revision of the scientific and common names of the specimens in our herbarium thus bringing them up-to-date. This revision was based on recent publications of the Bureau of Science and Bureau of Forestry.

(*b*) A list of the official common names of woody plants of the Philippine Islands is at present in process of compilation. This work is being done by Ranger Felipe Salvoza in coöperation with Wood Technologist Luis J. Reyes.

(*c*) All the important plants along the Molawin trail, from the Forest School to the Abaca plantation (about one kilometer), were marked with embossed labels. This work will be continued in 1923 until all the important trees on the trail to the summit and to the Mud Spring terminal will be so labelled. This is being done for the benefit of visitors.

(*d*) A key to the woody plants of the Makiling region, started by ex-Ranger Calixto Mabesa is being revised and will later be of use to the classes in Botany and Dendrology.

Additions have been made to the herbarium of the Division. Much of this material was obtained from the Manila Office. At present the herbarium contains 2,790 specimens, representing 117 families, 527 genera, and 1,210 species. This is an increase over 1921 of 262 specimens, 3 families, 37 genera, and 141 species.

A new species, *Adinandra canicosiae,* Merr. (Fam. *Theaceae*) was collected on Mt. San Cristobal by Forest Guard Florentino Canicosa and named after him by Doctor Merrill of the Bureau of Science.

The results of Dr. F. X. Williams' study of Ficus on Mt. Makiling were published by him in the Hawaiian Planters' Record.

3. UTILIZATION

(*a*) *Lumbering.*—As mentioned in last year's report, very little investigative work in connection with lumbering was done due to lack of funds for travel, inasmuch as the larger concessions are located at a considerable distance from Los Baños and a trip to collect information involves a heavy outlay for travel and per diems. However, some information was gathered by Foresters Cuzner and Dacanay while on their inspection of the Jolo teak reserve. Also some notes regarding utilization and lumbering in the Mountain Province were collected by Rangers Carlos Sulit and Justino Seguerra.

Work has been started on a uniform cost accounting system for the lumbering industry which when completed will be available for lumbermen. Some help on this project will be secured

from the Economics Department of the College of Agriculture where accounting is taught.

During February the class of 1922 visited the various sawmills, lumber yards, and wood using industries in Manila and also the preservation plant of the Atlantic Gulf and Pacific Company. This was in connection with the course in Forest Engineering IV.

This Division has been receiving monthly reports from the Division of Sawmills and Utilization which are useful in the instruction work in the school.

(*b*) *Minor Forest Products*

1. *Charcoal.*—The charcoal kilns constructed in 1921 were operated continuously this year. The kilns have shown very little deterioration inasmuch as they were well constructed and have been kept warm continuously. Various species were burned this year, particularly in the smaller, experimental kiln. The following table shows the results obtained from this year's operation:

	Small kiln	Large kiln
Number of charges	29	15
Number of cubic meters of wood used	35	135
Number of meters of charcoal produced	9	47
Number of sack of charcoal produced	148	591
Number of kilos of charcoal produced	2,048	9,619
Approximate cost of producing one kilo	₱.07	₱.04
Approximate cost of producing one cubic meter	16.59	8.13

It may be noted in the above table that charcoal is produced in the large kilns at a cost of 4 centavos per kilo. The present retail price at the Chinese stores in Los Baños is 10 centavos per kilo.

It will also be noted that costs are higher in the small kiln, indicating that very small kilns are not economical.

Analyses were continued this year by the Department of Chemistry at the College of Agriculture. These analyses show a wide variation in volatile matter, the range being from 2.51 to 28.8 per cent. The analysis of the ash shows a wide variation in the phosporic acid and potash contained. The variation in volatile matter is of considerable interest in connection with the possible use of charcoal as a fuel for internal combustion engines. Charcoal was furnished various entities, for experimental work, notably the College of Education, for use in its Domestic Science course.

2. *Other Products.*—The collection of material and data on other forest products has been continued and some investiga-

tions, notably of Palomaria oil, were made by the Department of Chemistry at the College of Agriculture.

Ranger Mamerto D. Sulit has compiled a list of the native dye plants of Laguna and Batangas and also a list of fish-poisoning plants used in these provinces.

The files contain considerable information on minor forest products, much of which is additional to that published in Bulletin 22. This will be worked up and published as soon as possible.

4. FOREST ENGINEERING

The following work in this subject was done this year:

(*a*) A topographic survey of four blocks in the Makiling National Botanic Garden; namely, Dampalit, Solokin, Dipangla, and Summit blocks. (See No. 1—Reconnaissance.)

(*b*) Intensive topographic survey of the Puting Lupa Block in connection with the course in Management. This was a compartment survey.

(*c*) A new and larger plane table map of the Forest School campus and vicinity was made on a scale of 1:1,000 and with a contour interval of one meter.

(*d*) The reconnaissance and preliminary survey of a new trail from the Forest School to the Mud Spring on the east side of the Molawin Creek.

(*e*) Differential leveling from the bench mark at the Forest School to the boundary of the Solokin Block. Part of this leveling was done along the Tranca trail and bench marks were set along it.

(*f*) *Office work was as follows:*

(1) Preparation of topographic maps of the four blocks mentioned in *a*.

(2) Plotting compartment survey notes of the Puting Lupa Block.

(3) Changing the contour interval of the map of Mt. Lobo from 50 meters to 10 meters.

(4) Construction of slope scales to facilitate contouring.

(5) Introduction of a mil-scale system into the Abney Hand Level in order to determine the distance to an accessible or inaccessible object. Accuracy was found to be approximately the same as that obtained in rough stadia surveys.

(6) Revision and indexing of the map files of the Division.

(7) Alignment charts for use in forest calculations.

A complete map of the Makiling National Botanic Garden, including topography, trails, boundaries, vegetation, white earth deposits, etc., will be completed early in 1923.

Differential leveling will be continued along the main trails as before.

New maps, from various sources, were added to the files.

5. FOREST MANAGEMENT (INCLUDING MENSURATION)

(*a*) *Growth Studies.*—The regular annual measurement of the 590 trees, comprising eight species in the Makiling National Botanic Garden, was continued this year. Complete tabulations have been prepared but no separate report has as yet been made.

The measurement of the pure Bagtican stand near the Forest School building was taken as before.

The measurement of the trees in the plantation was modified this year as stated in the previous annual report. The diameter of every tree was measured, but the average heights, based on about twelve trees in each lot, were taken instead of the heights of all the trees. This was necessary due to the fact that the trees have reached such heights that their measurement is quite difficult. In the case of some species we have figures of diameter and height growth for 10 years which can now be worked up.

No measurements on the unit area started on Mt. Makiling in 1917 were made this year. However, the figures already obtained are now being compiled. An attempt was made at the beginning of the year to lay out systematic plots for the determination of growth of unit areas within the Puting Lupa Block, but due to lack of personnel and funds this plan was abandoned. However, it is hoped that this may be carried out during the coming year, inasmuch as they will be of great value in solving the management problems of Philippine forests.

(*b*) *Working Plans.*—As mentioned under reconnaissance, the other four blocks of the Makiling National Botanic Garden were completed during the summer season. As soon as the stand and stock tables and maps are completed, the data gathered will be embodied in an intensive working plan for the Botanic Garden. The compartment survey of the Puting Lupa Block, which contains 10 compartments, as stated in the last annual report, was continued this year, and is practically completed with the exception of four compartments, whose distance from the Forest School makes their survey very inconvenient for the students. However, they will be completed as soon as possible. These compartment surveys are made for the purpose of checking the stand and stocks tables of the entire block. Strips are

100 meters apart and are twenty meters wide, thus giving a 20 per cent estimate whereas the estimate of the block was only 10 per cent. This 20 per cent estimate also furnishes a more accurate map. The strips in the compartments were run at right angles to those that were run in the block survey.

As fast as the work can be done, other blocks will be divided into compartments and the same percent of estimate made.

The working plan will be started early in 1923 as sufficient data is now available.

6. SILVICULTURE

a. *Reforestation:*

The reforestation problem of the Philippine Islands divides itself into four main heads as follows:

(1) Reforestation of all absolute forest lands not included within the communal forests.

(2) Reforestation of communal forests.

(3) Reforestation of forest lands privately owned whose owners desire to devote themselves to the growing of timber.

(4) Coöperation in establishing forest nurseries and plantations.

During the year 1922 an attempt was made to define the policy of the Bureau of Forestry toward the solution of the above problems. The details of this policy were embodied in a paper entitled, "A Policy for the Reforestation Projects of the Bureau of Forestry," which was presented by Forester Placido Dacanay at the Forester's Conference held on August 2, 1922. In spite of lack of funds and personnel for this work considerable progress was made in various projects, the chief of which are the following:

(1) More extensive reforestation on Mt. Makiling.

(2) More work done in the Ilocos provinces.

(3) Establishment of a nursery in Zambales.

(4) Reforestation work in connection with the Hacienda Esperanza, Rosales, Pangasinan.

(5) Increasing interest of the public in the work.

In brief it may be said that reforestation is next in importance to the actual administration of the public forest, and therefore should be pushed with much more vigor and interest in the coming year than it has ever received heretofore. The Bureau will follow the policy laid out, as fast as practicable. Large appropriations are needed for this work, and it is not until money is available that any marked progress along this line can be made. This problem has been solved successfully in other countries.

During the year the progress in the various reforestation projects under the supervision of this Division was as follows:

1. *Ilocos Reforestation.*—During the year, the two forest nurseries located at Caniaw, Vigan, and Agayaos, Santa, both in the Province of Ilocos Sur, were kept in good condition under the direct supervision of the officer in charge of District No. 2. There were two laborers employed during the year, each receiving ₱18 per month.

Field planting was done at Caniaw from July 10 to 14, inclusive, with 24 men, who were paid by the municipality of Vigan. The spacing of the plants was 5 meters by 5 meters, and the method used was the bare root with dibbles. During this planting season, there were 6,510 seedlings planted on an area of approximately 16.2 hectares. The species planted were as follows:

	Seedlings
Teak	3,400
Baguilumbang	1,500
Molave	1,500
Narra	50
Akle	20
Bitaog	10
Ipil	10
Balacat	20
Total	6,510

The average cost of planting 1,000 seedlings was ₱5.45. This was based on ₱0.50 per day for one laborer.

At the close of the planting season, there were about 2,000 seedlings left in the nursery at Caniaw for planting next year.

Besides these, there was a large amount of seeds sown in the nursery during this year.

The planting work in Santa was done during the period from July 15 to 20, inclusive. The laborers were paid by the municipality of Santa, and the area planted was approximately 9½ hectares. There were 3,825 seedlings set out, representing the following species:

	Seedlings
Teak	1,800
Molave	1,020
Baguilumbang	900
Akle	80
Balacat	25
Total	3,825

The average cost of planting 1,000 seedlings was ₱8.50.

In the two nurseries in Ilocos there were 336 liters of seeds of various species sown. Most of these were furnished by this Bureau from stock at Los Baños, Laguna. At present there are approximately 15,000 seedlings in the nurseries for field planting next year.

Due to the lack of funds, the reforestation plots established in previous years, in this region, were not inspected during the year. The communal forest of Santa Cruz was, however, broadcasted with ipil-ipil seeds, which was furnished by this Bureau.

The most urgent needs of the project are:

(*a*) Permanent employment of the two men now taking care of the nurseries at Vigan and at Santa. The failure to permanently employ someone to take care of these nurseries next year, will mean a considerable loss to the Bureau.

(*b*) Proper supplies and equipment for the nurseries, and the building of wire fence around them.

(*c*) Establishment of a nursery at Laoag.

(*d*) Proper protection of the reforestation plots from fire and grazing.

(*e*) Closer supervision. This needs a man especially detailed for the work.

2. *Zambales Reforestation.*—A forest nursery, having an area of 540 square meters, was established during the year in San Felipe, Zambales. In this nursery 167 liters of seeds were sown, consisting of the following species: Albizzia montana, Dao, Lamio, Liusin, Molave, Narra, Teak, and Tindalo. Some of the seeds have already germinated, and at present there are about 2,000 seedlings living. It is expected that next year there will be about 10,000 seedlings available for field planting.

In addition to the establishment of a nursery, there were three cavanes of ipil-ipil seed broadcasted on a cogonal adjoining the reforestation plot of San Felipe, Zambales.

The labor used in this project was furnished free by the municipality of San Felipe. Of all the towns in Zambales where reforestation plots were established, San Felipe showed the greatest interest in coöperating with the Bureau in planting up cogon lands. The reforestation plot established in this town in 1919 has been well taken care of by the municipality, and the ipil-ipil trees now have an average diameter of 5 centimeters.

The plots of San Narciso and San Antonio were inspected, but no seedlings of ipil-ipil were found, on account of the inadequate protection of the area from grazing and fire.

The needs of the project in Zambales are:

(*a*) The replanting of the plots of San Narciso and San Antonio. This work, however, will not be started until these municipalities have demonstrated their ability and willingness to protect the area. It is hoped that the work in San Felipe will serve as an object lesson to these two municipalities.

(*b*) The employment of a man to take care of the nursery.

(*c*) The continuation of the work next year, inasmuch as that part of the province is one of the seriously devastated regions in the Philippines.

3. *Pangasinan Reforestation.*—The work done in Pangasinan was in coöperation with the Hacienda Esperanza, at Rosales. A nursery of about 2,410 square meters in area was established from October 2 to 9, inclusive. There were 31,200 seeds sown of which 30,000 were teak and 1,200 narra. The total cost of establishing the nursery was ₱40.75.

The administrator of the Hacienda, Mr. Manuel A. Gonzales, has shown considerable interest in the work. An indirect benefit that may be derived from the project is the education of other financially able individuals to undertake similar work of utilizing the cogonal portions of their lands.

4. *Jolo Reforestation.*—The inspection of the Jolo Teak Reservation was made this year. During this inspection, it was found that the teak stands within the reserve consisted of scattered, open patches of coppice growth with dense cogon underneath. The trees were generally poor, crooked, fluted, and scrubby in character. Those of better quality have been cut, and those left on the area are only of value for cordwood and possibly for ties. The poor condition and quality of the trees in the area is due to the frequent occurrence of fires that burn over the tract.

Reproduction was very poor. Seedlings were hard to find but there were some sprouts present that have escaped fire. As soon as conditions permit, the reserve will be reforested, inasmuch as this is the only extensive teak forest in the Philippines.

5. *Cebu Reforestation.*—On account of the lack of funds, there was no planting done in the Cebu reforestation project this year. It was, however, possible to employ a guard to patrol the area, but this was not at all sufficient to protect the plantation from damage.

In connection with his trip to Jolo in March, 1922, Forester Dacanay made an inspection of the work in Cebu. During the inspection, it was found that the nursery located in Camp No.

2, had the appearance of a young forest. The plants planted on the rocky portion of the nursery in 1917 were counted, and their diameters at breast height were also measured. The following table shows the species, number of living plants, average diameter, and the average annual diameter growth:

Species	Number	Average diameter	Average annual diameter growth
		Cen imeters	*Centimeters*
Teak	562	8.7	1.74
Lumbang	172	11.57	2.31
Palomaria de la Playa	3	5.26	1.05
Supa	17	3.11	0.62
Mahogany (big leaf)	8	7.04	1.40
Albizzia lebbeck	210	6.60	1.32
Lanutan I	75	7.94	1.58
Prosopis sp	36	9.65	1.93
Narra	57	7.37	1.47
Acacia confusa	9	5.79	1.13
Molave	46	6.25	1.25

The total number of plants in this plantation was 1,195, and the average diameter at breast height was 7.2 centimeters, or an average annual diameter growth of 1.44 centimeters.

A survey made of the plantations in the various blocks, showed that the average diameters of Baguilumbang varied by 11.5 centimeters and that of Lumbang, 19.3 centimeters.

Taken as a whole, the results of the planting have been very successful. The greatest need of the project at present is adequate protection from fires, grazing, and caiñgin making. At the present rate of destruction now taking place in the plantation, the Government will soon lose the trees, unless effective means of protecting the area from possible damage are instituted.

6. *Corregidor Reforestation.*—During the year, there was no work done in Corregidor. After the project was well started last year, it was left to the military authorities for continuation.

7. *Arayat Reforestation.*—On account of the lack of available funds, no work was done on Mt. Arayat. The reforestation of this mountain should be started as soon as conditions permit.

8. *Cotabato Reforestation.*—The work carried on in Cotabato was in coöperation with the Deputy District Governor and Supervising Teacher of Auang, Cotabato. The ipil-ipil seed furnished by the Bureau was sown in various places. One-half cavan was sown on burned cogon land, on the hillside just south of the Auang Colony site. One-fourth cavan was sown along trails and roads, and the rest was planted on the tops of Kuriki, Lauluan, and Olu-Safalan mountains. It has been estimated by

the Deputy of District Governor that the per cent of germination is about 80.

9. *Makiling Reforestation.*—During the year the reforestation work on Mt. Makiling was carried on under a new plan, in which the caiñginero signs a contract with the Chief of the Division of Investigation, allowing him to make caiñgin on grass lands inside the Makiling National Botanic Garden. But in exchange for this privilege, the caiñginero is required to plant forest trees on areas designated by the Chief, Division of Investigation for a period corresponding to the size of his caiñgin, six-day labor being required for each hectare the caiñginero has under cultivation. The advantages of this new plan over the individual planting on cañgins, which was followed in previous years are as follows:

(*a*) The caiñgineros are grouped together into crews, large enough for efficient work under proper supervision.

(*b*) The work is confined to a certain definite area, instead of scattered in various individual clearings.

(*c*) A larger area can be planted with more success and at a cheaper cost.

The total area planted was 18.05 hectares, and the total number of seedlings was 62,326. Besides these, there were 2.5 kilometers of trail cleaned, and repaired, and 10 cavanes of ipil-ipil seed broadcasted on approximately 12 hectares.

The following is the summary of the work accomplished:

Total area planted	hectares	18.05
Total distance of trail cleaned and repaired	kilometers	2.5
Total number of seedlings planted		62,326
Total amount of ipil-ipil sown	cavanes	10
Average cost of cleaning one hectare		₱31.36
Average cost of cleaning and repairing trail per kilometer		15.22
Average cost of planting one hectare at 2 m. x 2 meters		31.17
Average cost of broadcasting one hectare		[a] 11.00
Total expenses for the project		1,519.72
Amount paid by Bureau of Forestry		494.72

[a] Students were used in this work, hence the cost is very high.

With the exception of the last figure given, namely, ₱494.72, which includes the student labor used in broadcasting, no other money was spent on this project as the other costs are based on a wage of one peso per day per man and inasmuch as the caiñgin labor was free these costs are only given to show what such a project would cost if the labor was hired.

The amount (₱494.72) spent by the Bureau includes the cost of raising the seedlings, cost of transplanting, cost of

digging them out of the transplant bed and salaries and per diem of one forester, two rangers, and two forest guards who supervised the work.

10. *Summary of Reforestation Work.*—All of the projects mentioned above are still unfinished, and they should be continued next year. Of the urgent pending projects enumerated last year, the following have not as yet been started. These should be carried out next year or as soon as conditions and funds permit:

(*a*) Establishment of a forest nursery at Laoag, Ilocos Norte.

(*b*) Establishment of reforestation plots in La Union.

(*c*) Planting of Salinas Forest Reserve, Nueva Vizcaya.

(*d*) Inspection of the proposed reforestation area near Bamban, Tarlac.

(*e*) Inspection of the Cagayan Valley for reforestation.

(*f*) Inspection of the Friar Lands at Sucat, Rizal.

The reforestation of the Agno River Watershed to prevent erosion and excessive run-off, is a project which is still under consideration. This work would require large appropriations and a long time to do it before satisfactory results could be shown. It is hoped that, next year, an inspection of the area can be made to determine those areas which should be reforested for protection purposes.

b. *Nursery:*

The nursery in hectares D and F has been used for the past year, mainly, for the production of ornamental stock. Part of this area is used to reproduce these ornamentals from cuttings. The new nursery constructed in hectare A has been increased by clearing an additional area which was formerly planted to ipil-ipil. The most of the area of this nursery is used for forest purposes; that is, all the material for reforestation purposes on Mt. Makiling and to supply such requests from outside, as we have been able to fill, have been grown here. At present this nursery contains 94 seedbeds. In addition to the potting house constructed last year, a seed storage house, with bamboo walls and nipa roof, was built. A shed to furnish shade for seed flats, which is roofed with cogon, is at present under construction.

The following stock is on hand in the nursery at present:

Timber species	49,360
Ornamental species	12,200
Total	61,560

This sum is less than that given for 1921. This is due to the fact that over twice as much stock was distributed in 1922 as in the previous year.

Considerable molave, teak, malaruhat, and other commercial species were raised in our nursery last year, most of which was used on the Makiling reforestation.

c. *Arboretum:*

The arboretum has been kept in good condition throughout the year. One hundred forty-seven new plants were added to the arboretum, making a total of 663 plants at the end of this year.

d. *Reproduction Studies:*

The reproduction plots in the logged over area of the Cadwallader-Gibson Lumber Company in Bataan were not visited this year, due to the lack of personnel and funds. An attempt will be made to inspect these plots in 1923.

e. *Silvical Leaflets:*

No new silvical leaflets were prepared this year and most of the class of 1923 have been kept in the forest, receiving instructions in making silvicultural descriptions and marking timber.

Practically all species available here have already been written up in our silvical leaflets and information on those not occurring here is not available.

f. *Seed Collections and Distribution:*

Approximately 1,770 liters of seeds were received of which 1,735 were from sources within the Philippine Islands and 35 from foreign countries. This is considerably less than the previous year. Seeds of Cinchona were received and have been shown in nursery flats but thus far the results are slight due to damping-off of the seedlings.

Approximately 152 liters of seeds were distributed from this office, 119 to various places in the Philippine Islands, and 33 to foreign countries. This is considerably less than was distributed last year, the reason being that our stock was too small and there was not sufficient personnel to gather seeds. Four hundred ninety-four liters of seeds were sown in the seed beds in the nursery this year, and there is on hand, at present, 573 liters ready for sowing and distribution. Many requests for seeds of various species were received but it was impossible to comply with all of them due to the reasons mentioned above.

g. *Plant Accessions and Distribution:*

Only 48 plants were received this year, all of which were from the Baguio Nursery. They consisted of three species of

Eucalyptus and five species of Conifers. These have been set out upon the Forest School campus and most of them are doing well.

A total of 75,765 plants were distributed from the nursery during the year, 63,115 of which were timber species and 12,650 ornamentals. This is more than double the number distributed last year. The majority of the ornamentals were sent to the Culion Leper Colony and also to various places in Manila. The majority of the timber species distributed were used in the Makiling reforestation.

h. *Plantations:*

No new areas were added to the plantations this year as it required all our force to keep those already established in good condition. All of the older plantations which were badly over grown with vines, shrubs, and weeds were cleaned the latter part of this year, thirteen hectares being done by contract labor and the remainder by student labor.

During the heavy typhoon this year, 59 trees were blown down representing a total volume of approximately 3.3 cubic meters.

The failed places in Hectare 2-B were planted with 241 seedlings of various species of Hydnocarpus (the source of chaulmoogra oil) which were large enough to remove from the nursery. Forty-one palms representing four species were planted in Hectare D.

One hundred and forty seedlings of Balsa (*Ochroma lagopus*) were set out in Hectare A during January. The growth of these trees has been remarkable, the three largest having reached a height of 5.04, 4.72, and 4.30 meters respectively in less than a year from transplanting. At present only 54 trees survive as many were destroyed by the typhoon and some by an insect attack.

The Mahogany (*Swietenia macrophylla*) planted in 1914 in Hectare C, fruited late this year which is eight years since its planting.

The present area of the plantations is approximately 84 hectares.

i. *Studies:*

In addition to other studies continued from last year a field study of the growth and behavior of Malaruhat (*Eugenia* sp.) under a dense stand of ipil-ipil was started. This is being done for the purpose of finding out the best nurse crop for this species and whether one is necessary or not.

A study of the growth and development of stands on Mt. Makiling from a silvicultural standpoint will be started next year.

The complete silvicultural and economic study of Narra (*Pterocarpus indicus*) is practically completed.

7. WOOD TECHNOLOGY

a. *Durability Test:*

This work has been carried on as usual. No new important material has been added except two pieces of ipil-ipil 50 centimeters long and 15 centimeters in diameter. The annual examination was made on September 6, 1922.

b. *Wood Collection:*

No additions were made to the wood collection this year. The present collection contains 1,756 specimens representing 112 families and 924 species. This is exclusive of the 204 specimens on the display rack in the classroom. Of the above total, 481 specimens representing 45 families and 359 species are foreign woods mostly from Borneo, Sumatra, Burma, Sarawak, and the Malay Peninsula, with a few from Argentina, Guam, Cochin China, Java, Australia, and the United States.

c. *Other Work:*

A preliminary test on the relative resistance of commercial Philippine woods to fire was made this year. The results obtained are satisfactory considering the crudeness of the apparatus and method used and also the inexperience in carrying on this kind of work. This will be carried further in 1923 as soon as more complete apparatus can be set up. The results of this experiment should be of value to fire insurance companies and to building contractors.

8. FOREST ENTOMOLOGY AND PATHOLOGY

a. *Forest Entomology:*

The research work started by Professor H. E. Woodworth, of the College of Agriculture, with the assistance of the ranger personnel, was continued this year. Considerable information, particularly in reference to the damage and host plants of bokbok, was obtained. The identification of new species was made by an Austrian scientist. The breeding work which was started here is still being carried on. Doctor Uichanco, of the College of Agriculture, has continued the work since the departure of Professor Woodworth for the United States. He is at present being assisted by two rangers from this Division. Some material from sawmills was sent in by the field force but the identifications are not as yet completed.

b. *Forest Pathology*

Very little work along this line has been carried on since Professor Reinking left for the United States. However, Professor McWhorter, Acting Head of the Department of Plant Pathology, College of Agriculture, has started some work in coöperation with this Division, the results of which have not as yet been secured. This work will be continued in 1923.

9. PUBLICATIONS AND PROPAGANDA

a. *Publications:*

Volume III, of Bulletin 22, of this Bureau entitled, "Minor Products of Philippine Forests," was issued this year and complete sets of three volumes each were distributed. This makes a very valuable reference work, especially to those using minor forest products in the Tropical Orient. This publication was reviewed in the Indian Forester for December, 1922. The reviewer states as follows: "The three volumes under review give a large body of information and are a credit to the Philippine Bureau of Forestry." This publication was also reviewed in the Makiling Echo published by this Division. Fortunately, this Division was equipped with a Roneo in the latter half of the year which enabled it to issue the publication mentioned in last year's report. This publication is known as the "Makiling Echo," and supersedes the Mountain Echo formerly issued by this Bureau. A double number was issued in September and another in December. Starting in 1923, four numbers will be issued. The purpose of this publication is to serve mainly as a medium of educational value so that the field force may obtain new information along forestry lines. It is also intended to serve as a medium between the Forest School and the rangers in the field so that they may know what is being done here. It is also used to secure data from the field force.

The handbook for Philippine Forest Rangers mentioned in the 1921 report is still in process of preparation but this work has been delayed more or less due to the pressure of routine work and the instruction which must be given in the Forest School. This work will be pushed as rapidly as possible so that this publication may soon be available for the field force. It will also serve as a textbook in the school.

b. *Propaganda:*

Several newspaper articles were written by various members of this Division. The most notable of which is a series entitled "The Value of Forests to the Farmer," by Forester Placido Da-

canay. Three numbers of this series have been published in *La Vanguardia.*

Several talks were delivered by personnel of this Division, mainly in the Laguna schools on Arbor Day.

This Division participated in two exhibitions during the year, one on Farmer's Day at the College of Agriculture and the other on University Day at the University of the Philippines in Manila. Forest products, seeds, etc., were exhibited.

10. IMPROVEMENTS AND EQUIPMENT

a. *Improvement:*

The following improvements were made this year:

(1) Reroofing the student mess hall and kitchen and repair of the student baths.

(2) Resurfacing of the Forest School road and construction of six culverts.

(3) Construction of three nursery sheds in Hectare A and the addition of new nursery beds.

(4) Ornamental planting on the Forest School campus.

(5) Construction of new paths around the student quarters.

(6) Additional collections for the Forest School museum.

(7) Increase in area of the student gardens.

(8) Repair of the trail from the Forest School to the summit of the mountain.

(9) Reconstruction of the hut on top of Mt. Makiling.

(10) Repair of student quarters, school building, etc.

(11) Ornamental hanging plants for the student houses and mess hall.

(12) Repair of the athletic grounds.

In addition, the Forest Station and Foxworthy cottage were completely repaired, the latter being reroofed. No work was done on the short cut trail from the Swimming Pool to the summit trail. This will be continued in 1923 with student labor.

11. ADMINISTRATION

a. *Personnel:*

The present force of this Division consists of one chief of division who is in charge of the Forest School, one forester in charge of silvicultural investigations, one forester in charge of reforestation, one forester in charge of forest engineering, three senior rangers and five rangers on special work, and one clerk. Forester Luis R. Salvosa and Rangers Alejandro de Mesa, Mamerto D. Sulit, and Andres Lemos are new additions to the staff.

The non-technical force consists of seven forest guards, six nurserymen, one electrician, one boiler man, and nine day laborers. Three of the guards are used for patrol work on Mt. Makiling and for botanical and wood collection. The remainder of the guards are used partly for patrol and partly for work in reforestation and in the nursery.

In order to increase the efficiency of the staff, it is absolutely imperative that the ranger personnel, particularly those rangers engaged in teaching and especially the older men already trained in the work of the Division, should be sent to the United States as fast possible. The necessity of this is evident as these men who are teaching should receive as broad a view point of forestry as is possible.

b. *Makiling National Botanic Garden:*

The administration of the Botanic Garden has been carried on as usual with the personnel available.

(1) *Licenses.*—There are no commercial timber licenses operating in the Botanic Garden. At present there are only four minor forest product licenses in force in the Botanic Garden proper as follows:

Number of licenses operating	Product	Amount in cubic meters
3	Firewood	730
1	White earth	100

There is one pasture permit in force. It may be necessary at the end of 1923 to cancel firewood licenses, inasmuch as the stand of timber on the lower slopes of the mountain will not stand much more cutting. Accessible areas have already been heavily cut.

(2) *Gratuitous Permits.*—During the year, 77 gratuitous permits were issued, 47 being for timber, for personal use, and 30 for minor forest products. The total amount of timber granted under gratuitous permit was 110.65 cubic meters of second, third, and fourth group timber. One thousand four hundred eighty-six kilos of minor products were issued under gratuitous permit, consisting mainly of hinguiw, kamagsa, orchids, cabonegro leaves, mosses, etc.

(3) *Caiñgin Permits.*—During the year 67 caiñgin permits were issued within the Botanic Garden proper in connection with our reforestation project. This has been fully described in the Makiling Reforestation. Such individuals as have shown

proper coöperation in this reforestation will be granted permits in 1923 provided the area is available.

(4) *Game.*—As mentioned in the report for 1921, promiscuous hunting in the Botanic Garden has been prohibited. However, the wild pigs have become so numerous that they cause damage to the nurseries and gardens and also to the plants in the College of Agriculture lands adjacent to the reserve. For this reason it was deemed expedient to let a few responsible individuals hunt wild pigs and eight permits were issued which expired at the end of this year. It seems apparent that the pigs have become less numerous and therefore no hunting permits will be issued in 1923, unless they again become a nuissance. The number of birds has greatly increased due to the prevention of excessive hunting. Some illegal hunting has been done by people living in adjacent towns and barrios and especially from San Pablo and Alaminos.

(5) *Calamba Estate Addition.*—This is not a part of the Makiling National Botanic Garden at present, except that its management is in the hands of the Bureau of Forestry and is under the direct supervision of this Division. The agricultural portion of this area has recently been recommended by this Bureau for permanent agricultural use. As mentioned previously in this report, the reconnaissance for 1923 should show the agricultural and non-agricultural portions of this area. As soon as this is determined, that portion which is absolute forest land should be included permanently in the Makiling National Botanic Garden.

During the year 1922 there was one ordinary timber license in force which was for 10 cubic meters of timber. There were six minor forest product licenses as follows:

Number of licenses operating	Product	Amount
		cu. m.
2	Firedwood	250
1	Charcoal	50
		kilos
2	White earth	224,180
1	Lumbang fruits	2,000

The people cultivating the open areas in this land were granted caingin permits in accordance with the reforestation program as mentioned before. One hundred eighty permits of this sort were issued. However, no permits will be issued in 1923 for that part of the area recommended to be set aside as agricultural land.

12. COÖPERATION

a. *College of Agriculture:*

We have carried on the usual coöperation with the College of Agriculture, particularly with the Professor in charge of the Engineering Department, the Departments of Chemistry, Entomology and Plant Pathology. They were furnished with such information and material as was available. The Division is particularly indebted to the College of Agriculture for the use of trucks on numerous occasions, particularly for the hauling of express and freight.

b. *Other Institutions and Personnel:*

(1) *Bureau of Education.*—Early in the year a trail from Nagcarlan to the summit of Mt. San Cristobal was surveyed by Forester Antonio P. Racelis, Ranger Mamerto D. Sulit, and Forest Guard Florentino Canicosa. Later this trail was constructed under the supervision of Forest Guard Canicosa, assisted by voluntary laborers from the municipality of Nagcarlan who had been secured by the Division Superintendent of Schools for Laguna. Four additional guards were furnished by this Division to assist in the work. This opens up the scenic beauty of San Cristobal and assists the guard personnel of District 5 in patrol work.

(2) *Miscellaneous.*—The Bureau of Science, as usual, has been of great assistance in the identification of plants and in making valuable suggestions regarding the work in Dendrology and Botany.

Dr. F. X. Williams continued his work on Mt. Makiling this year and was furnished such help as the Division was able to give him. Mr. Edward H. Taylor, formerly of the Bureau of Science, spent a week collecting zoölogical specimens on Mt. Makiling and was furnished a guide, cargadores, and necessary equipment for his work.

The Division is also indebted to those persons and institutions who furnished seed, most of which was received from foreign sources.

13. MISCELLANEOUS

a. *Museum:*

Additional material has been gathered for the museum particularly vines, minor forest products, etc. The snake collection has been continued and some valuable specimens secured part of which have been turned over to Mr. Edward H. Taylor for identification.

b. *Cost Account:*

Complete records have been kept during the year of all money expended for the various projects; such as travel, research, reforestation, charcoal manufacture, nursery work, plantation management, administration, etc. These are now being compiled in tabular form so that we may know the approximate cost of each project in the Division.

THE WORK IN BAGUIO

PACDAL NURSERY

The nursery laborers were continuously employed in the regular work at the nursery which on account of its large size and poor soil requires the continuous employment of about five laborers, for the regular work of preparing beds, weeding, fertilizing, and transplanting. When these laborers for various reasons are taken from the above work and employed for a few days on other projects the nursery work suffers. It has been found necessary during the off-season to concentrate the work of weeding and fertilizing to only a portion of the nursery especially the seed-beds and the transplant beds where very young plants have been transplanted while the other portions of the nursery specially where the plants are more than fifty centimeters high were abandoned as far as weeding, watering, and fertilizing are concerned.

Very few improvements were made during the year due to the shortage of men. However, the temporary steps connecting the various levels in the nursery were replaced with stone, from rubble gathered from the creek crossing the nursery. With very little attention these steps can now be kept in good condition. Several hundred pines, cypresses, eucalyptus, and other plants for which there is great demand by outsiders, were planted in bamboo tubes and empty cans for ready distribution. The use of these receptacles, especially the cans, which can be obtained from the City Incinerator, has simplified greately the work of distributing plants from this nursery and has saved the time used by the laborers in digging and wrapping them for shipment outside of Baguio.

In order also to economize labor and material, the regular entrance was closed against wheel-traffic which made it necessary to keep in continuous repair the three bridges along the entrance road. The present entrance for wheel-traffic is from the Gibraltar road where only one bridge has to be crossed.

Nursery Records.—The nursery records have been kept up as in previous years with a slight modification intended to im-

prove them. The division of the nursery area into small lots and listing all the species found in each lot at the end of each year makes it easy to keep the different species under observation properly labeled even in case of the labels being misplaced by ignorant laborers.

Planting for 1922.—This year has been noticeable for the very small amount of imported seeds used in stocking the nursery. This is in keeping with the policy started some years ago of propagating plants and restock the nursery by means of cuttings. Nearly 56,000 cuttings of about 30 of the most successful species were planted this year which will fully restock the nursery. Besides these, there were sown over 16 liters of flower seeds which required a good deal of attention, it being our purpose to grow more and more ornamentals in the future for use in the City of Baguio.

A big order for flower seeds and shrubs for use in City beautification was sent during September with the expectation that it would reach here by November and December but for unknown reasons, it was not received until the middle of December. Half of these seeds were sown at once to flower towards the latter part of the season while the other half of the shipment will be preserved for planting in September next year. This second planting will furnish color and flowers from Christmas on (1923) and such as will produce fertile seeds can be propagated again for the season next following.

Some of the nursery area may yet be reserved for the growing of fruit trees such as nangca, coffee, orange, and others as the City Mayor has repeatedly insisted that we plant fruit trees together with the ornamentals whenever possible. Among the species propagated this year is the *Araucaria bidwilli* which was especially recommended. This species is bound to be a very valuable introduction and several thousand seeds will be secured as soon as funds permit.

We are also fortunate in receiving a heavy shipment of Cinchona seeds (3 species) which were secured through the aid of His Excellency, the Governor-General. It seems that, so far, Baguio is the only place where cinchona can be raised with any degree of success and with the 6,000 seedlings which we were able to obtain from this year's planting we expect to be able to try them in various localities in Baguio, and will be in a position to send potted plants to Bontoc and other neighboring provinces, in an effort to find out the best location for its growth.

Some of the species which were heavily propagated this year were: Chestnuts (*Castanea vulgaris*) 2,000 cuttings, Camphor

(*Cinnamomum camphora*) 3,600 cuttings, Basket Willow (*Salix multinervis*) 600 cuttings, Olive (*Olea europea*) 200 cuttings, Red cedar (*Juniperus virginiana*) 2,200 cuttings, Japanese cedar (*Cryptomeria japonica*) 7,100 cuttings, and several species of cypresses.

Fertilizers.—Due to the distance of the nursery from the sources of stable manure and the growing demand for it by private gardens, etc., it has been very difficult to secure an adequate supply. Recently, however, we have found a source of fertilizer in the materials removed from one of the septic tanks in Baguio. This will be a great help for the nursery in the following year specially as it is planned to grow fruit trees, some of which develop very slowly unless given very fertile ground.

Nursery stock.—There are at present in the nursery 81,494 plants for the planting next year and for distribution 13,270 plants, of which 5,000 are trees 50 centimeters and over, 8,000 shrubs and herbaceous plants and 270 vines. These do not include the small plants that are not ready to be set out and those that are still in the seedbeds.

Distribution.—There were removed from the Nursery for various purposes as shown below a total of 11,114 plants.

	Plants
For private parties	2,307
For City of Baguio	1,410
For Forbes Park	7,397

Plantation.—The experimental plantation near the Nursery has received the following additions:

Acacia arabica	4	Eucalyptus stuartiana	14
Acacia farnesiana	16	Fraxinus excelsior	1
Albizzia montana	70	Gynmocladus canadensis	110
Alnus glutinosa	1	Juglans sp	4
Bixaorellana	35	Liquidambar styraciflua	13
Cassia fistula	3	Leea euphlobia	4
Castanea vulgaris	2	Ormosia calavensis	15
Castanea shibaguri	6	Pinus insularis	68
Corylus avellana	3	Pinus insularis	196
Calycanthus floridus	5	Robinia pseudacacia	3
Diospyros sp	4	Eucalyptus sp	1
Dalbergia sisso	2	Dalbergia latifolia	17
Dysoxylum sp	4	Sapindus vitiensis	2
Sesbania argystica	1	Thuja gigantea	1

The semipermanent labels, 12″ x 16″, used to mark the different species in the plantation have proven to be effective.

There was no trouble this year in locating them and they added much to the interest of persons visiting the nursery and plantations.

Reforestation.—The reforestation project at the Hydro-electric Plant and at the headwater of the Antamok River have been inspected and found to be making satisfactory growth. The reforestation trial at kilometer 3 on the Trinidad road was inspected by Forester Laraya. The Eupatorium which was planted there over a year ago is persisting but has not yet seemingly got a good start. The reforestation work done during past years in Trinidad is developing successfully in spite of the heavy grass on the area, there being an excellent protection against fire damage through the great interest taken in it by Mr. Wright, the Principal of the Agricultural School. The reforestation work this year consisted in coöperating with the Trinidad Agricultural School, under Mr. Wright, in planting about 5 hectares of mountain land with *Albizzia montana* and sowing 90 liters of ipil-ipil by various methods over 15 hectares of ground in the neighborhood of the school.

Economic species.—The following species have been under observation in the nursery and are showing promise of becoming thoroughly acclimatized:

Castanea vulgaris	Chestnut.
Castanea koraiensis	Chestnut.
Araucaria bidwilli	Edible nuts.
Olea europea	Olive.
Cinnamomum camphora	Camphor.
Cinchona (3 species)	Quinine.
Thea (2 species)	Tea.
Salix multinervis	Basket willow.
Chrysophyllum oliviforme	Caimitillo.

Those that are still doubtful as to the future results are:

Pirus malus	Apple.
Pistacia chinensis	Edible nut.
Juglans sp	Walnut.
Vaccinum cumingianum	Blueberry.

As stated before, it will be necessary to secure some 10 or 20 specimens of each of the various fruit trees now being distributed by the Bureau of Agriculture to try their adaptability to this locality before they are used extensively as stock plants in the City system of planting.

Forbes Park.—Since the arrival of Ranger Oro, it has been possible to undertake more intensive work in the Park. A detailed plan of development based upon both a practical and the

artistic application of landscape design was prepared by Mr. Oro with the help of other rangers and guards. The progress made in carrying out the plan is indicated by the fact that 5½ kilometers of hedges were planted besides some 7,397 trees and shrubs. These plants will not attain their best development for several years and in consequence the full effect of the work will not be noted for some time.

Coöperation with the City of Baguio.—Early in the year the City laborers were employed in the maintenance of the various City parks and drives, their work consisting of weeding about the trees and shrubs, watering during periods of drought, trimming hedges, and the usual routine necessary for the maintenance of parks and boulevards.

During March, April, and May, these same men assisted in the fighting of fires and patrolling to detect fire-setters. Some have also been used in the collection of pine seed and ornamentals for propagating in the nursery, for use later in and around the City.

At the suggestions of the City Engineer some flower beds were started on a piece of flat ground in front of the City Hall, where a formal graden was laid out. The seeds ordered from the United States for use here were delayed and only came about the middle of December. Half of the shipment was sown at once to flower towards the latter part of the season and the other half was kept for sowing in September of next year to flower by Christmas and early in the Baguio season. From this early planting next year it may be possible to save sufficient seed for use in 1924.

Definite development and planting plans were also prepared for the north side of Burnham Park just back of the stores on Session road; a portion of which was made into a park and another was developed as a playground. The trees bordering the park were set during this planting season and the interior divisions, walks, and paths as well as the ornamental beds would have been laid out if the ground had the desired levels.

FIRES

Considering the evil effects of forest fires on the pine vegetation specially as concerning the future supply of lumber and firewood, a decided effort was made this year to control the common source of fires—which is incendiarism.

It is the inveterate custom of the Igorots to burn the pasture land as well as forest land to get fresh grass a little ahead of the rainy season and only for this slight advantage gained,

hundreds of thousands of pine seedlings are sacrificed which have required from 5 to 15 years to reach their present size. With the annual recurrence of fires (as long as pasturing is allowed) within the City limits and in the neighboring regions upon which the City and mines depend for their supply of forest material, the problem of insuring the future forest supply will remain unsolved.

Accordingly, a serious effort was made to reduce the fires this year. The patrolling for fire-violations was intensified while a good fire-fighting squad was trained and was always ready to rush out in answer to a fire call.

Early in the dry season there were hopes that the fires would be greatly reduced specially as positive warnings were issued early and given due publicity, threatening to close against pasturing an area which was burned during the year. But towards the end of the season, the "poor" Igorots got busy and being quite human had seemingly found a way to double cross our efforts. It was then that our fire-fighting squad was at its best and fires could hardly get a start before our men were there to put them out. Then as if by well-studied tactics we found ourselves receiving fire reports from several quarters of the City at once and it was at this point that we had to call upon such organizations as the Constabulary, the Police, the City Prisoners, the Provincial Prisoners, and others. It was not easy to get instant help from these sources as they evidently were not expecting such emergency calls and yet, if the small fires are put out before they get beyond control and become highly destructive to property and even to life, there would not be need of calling out more than a few of the Police and Constabulary to help the Bureau of Forestry in this arduous as well as perilous work when the latter is powerless to do it unaided by other Government entities.

One of the fires this season which spread into Camp John Hay killed an American Officer who, with a detail of Scout soldiers, was sent to put out the fire. Another big fire threatened to burn up some of the Baguio Hospital buildings.

The Bureau of Forestry and the laborers given by the City of Baguio to help in this work are well instructed and organized to meet these emergencies but the fire protection plan in the following year should include a definite understanding with the Police and Constabulary, so that these two entities will be well instructed as to what to do and organized so that they too will be instantly ready to come to the help of the Bureau of Forestry, when their prompt assistance is imperative.

FOREST CONSERVATION

It is gratifying to report an appreciable reduction in the amount of firewood cut this year, the total being 7,449 cubic meters as compared with 10,910 cubic meters of last year.

All the big firewood users cut considerably less this year. The amount of lumber cut for building purposes is about the same as last year.

A marked change in the policy of conserving the city forests was inaugurated and enforced this year. Instead of permitting light cutting inside of the City where the forests are in secluded places and calling for the removal of old and mature trees, we have decided to reserve the trees that would thus be cut for use during emergencies as in case of long protracted stormy weather when a shortage of firewood is sometimes experienced.

In accordance with this change in our policy which takes into consideration the wishes of His Excellency, the Governor-General, we have practically closed the cutting areas in the City and made the necessary adjustments to give the licensees other places.

This policy is now well enforced and will for a time preserve what little timber there is in the City for emergencies but this is still far from definitely conserving the pine vegetation in the City.

There are two main reasons for this statement:

First.—Because the present pine stand which gives Baguio its beauty and its cool climate is now mostly in private lots or Bureau reservations. The Bureau of Forestry and the City Forester have both very slight control of the cutting of trees in these lots and reserves and so we are not in a position to guarantee their conservation through best use. Neither is there another Government entity which has this responsibility and the pine forests we see in the City of Baguio are thus left in the hands of the lot owner, whose interest is personal and often at variance with that of the community as a whole.

Second.—The pasturing and fire problem inside of the City unless radically and decisively handled is bound to continue as it has for the last 10 years. We find that pasture areas have increased instead of decreased in size, to balance the areas which were formerly forests but which have been converted into residential lots and public grounds. If this condition is allowed to continue then all efforts for conserving the pine forest in the vicinity of Baguio will be nearly useless and it is not pessimistic to imagine that 20 years from now when all the private lots should have been built upon and the pines cleared away to

make room for gardens, the only pine stands will be found in Forbes Park and along the creeks and ravines which were not sold as lots.

To prevent such a condition which will undoubtedly affect Baguio's interest to visitors, Baguio's climate and beauty, for the worse, it is necessary that some or all the areas now used as pasture be made to compensate for the above loss, by a rigid limitation of pasturing or the total closing of all Baguio against pasturing which alone will stop all fires and will allow the pine forest to reproduce itself on the areas which are at present burned over yearly for pasturing purposes. These are drastic measures, we must admit, but Baguio's interest and future welfare demand them now.

As soon as this is done, the Bureau of Forestry and the City of Baguio can undertake to carry out more extensive reforestation projects, which are not advisable under the present circumstances, due to the big fire risk.

STUDIES

Growth of Benguet Pine.—Forester Laraya was put in charge of computing and continuing the growth studies started five years ago. It is interesting to note that the results we obtained basing our estimates upon only one year's records are not far from the results obtained now after five years' observations. The data obtained is from measurements of the ridge and also for the valley type of forest and it will be used in computing the future yield of forests in Baguio.

Turpentine.—The studies to determine the possibility of opening up this industry in the pine region were started over a year ago, but due to the lack of proper implements to carry on the work our results are not yet conclusive. However, there is a complete set on the way and we expect to have more dependable figures and estimates in another year.

So far, our results give a very much heavier flow of resin and pitch than can be secured in the United States and if the analysis of the Philippine turpentine shows it to be as good as the United States product, this industry may be another source of employment and profit in this province as the trees can be tapped once or twice before being cut down for lumber or firewood.

FOREST SCHOOL

1. ENROLLMENT

The school work for the year 1922 started on January 9, after the usual Christmas vacation. The enrollment consisted

of twenty six Juniors and twenty five Seniors, three of the former being British North Borneo pensionados and two of the latter likewise.

During the year eight students were dropped, one for sickness and seven for poor scholarship. The class of 1924 entered the Forest School on April 3 with an enrollment of twenty-seven. During the summer term in Botany I three students left the class either due to poor scholarship or the fact that they did not like the work. Their places were filled from the applicants from the College of Agriculture.

The present enrollment consists of twenty-four Seniors in the class of 1923 and twenty-four Juniors in the class of 1924, three of the former and one of the latter being British North Borneo pensionados.

The following tabulation shows the enrollment by provinces of the Forest School as of December 31, 1922:

Province	Juniors	Seniors	Total
Abra	.....	1	1
Albay	.....	1	1
Bataan	2	.....	2
Cagayan	.....	2	2
Ilocos Norte	3	4	7
Ilocos Sur	.....	1	1
Iloilo	1	1	2
Isabela	.....	1	1
Laguna	1	1	2
La Union	2	1	3
Leyte	1	.....	1
Misamis	1	1	2
Mountain Province	.....	2	2
Nueva Vizcaya	1	.....	1
Nueva Ecija	1	1	2
Occidental Negros	2	.....	2
Pampanga	1	.....	1
Pangasinan	3	2	5
Samar	1	1	2
Tayabas	1	.....	1
Tarlac	2	2	4
Zambales	.....	2	2
Zamboanga	1	.....	1
Aggregate	24	24	48

2. FACULTY

The following changes have taken place in the teaching staff:

a. *Additions:*

Luis R. Salvosa, Professor of Engineering and Mathematics; B. W. Fullington, Assistant Professor of English; Placido Dacanay, Assistant Professor of Silviculture; Alejandro de Mesa, Instructor in Forest Administration; Mamerto D. Sulit, Assistant in Dendrology; and Andres Lemos, Assistant in Wood Technology and Botany.

b. *Transfers:*

Associate Professor T. C. Zschokke to the Manila Office; Assistant Professor Antonio P. Racelis to the Manila Office; In-

structor Maximo Oro to District No. 3; Assistant Francisco L. Rola to field work on reforestation; and Assistant Pioquinto de la Vega to the Manila Office.

The present force is ample to handle all the work in the Forest School at present. When the degree course is fully inaugurated, at least two more professors and additional instructors will be needed but possibly not until 1924.

3. INSTRUCTION

As in the previous year all instruction in the ranger course was given at the Forest School. The class of 1924 spent the summer term in Botany I. The instruction was diversified by lectures, laboratory work, and field trips in the Makiling National Botanic Garden. This work was handled by Instructor Nano with the assistance of Instructor Felipe Salvoza.

The class of 1923 spent this term in reconnaissance work on the remaining portion of the Makiling National Botanic Garden. Field work began on March 28 and ended on May 12. This was the usual work in Forest Engineering II, and was in charge of Instructor Carlos Sulit assisted by Instructor Felipe Salvoza (part time) and Assistants Justino Seguerra and Mamerto D. Sulit. The class spent practically all its time in camp where, in addition to the usual work in engineering and timber estimating, they were taught various phases of camp life, such as construction of temporary camps, camp sanitation and hygiene, etc. The details of this reconnaissance are described in the Division of Investigation report.

The first semester began on June 5, 1922 and ended on October 28. There was no inter-semester vacation, the second semester beginning the following Monday, October 31, Christmas vacation began December 16, one week extra being granted, due to the lack of the inter-semester vacation mentioned above thus making three weeks in all. The student body as a whole has shown good scholarship and both classes contain several excellent students.

During the first semester the work in Military Drill was taken over by the personnel of the Department of Military Science and Tactics thus relieving the Forest School personnel of this work.

Instruction in woodsmanship was continued as usual this year and is under the supervision of competent instructors. It includes swimming, first aid, sanitation, rope work, various features relating to camping, etc.

Various lectures were delivered before the Faculty and

Student body by Dean Arthur F. Fischer and Wood Technologist Luis J. Reyes.

4. IMPROVEMENTS

The following is a list of the improvements made at the Forest School during the past year:

(*a*) *Mess hall and kitchen.*—The nipa roofs of the mess hall and kitchen which were very rotten and in bad shape were torn off and replaced by a galvanized iron roof which makes conditions in these buildings lasting and very satisfactory. The student baths under the kitchen were repaired and put in good shape.

(*b*) *Forest School Road.*—Those parts of the road needing repair were resurfaced this year. In addition six culverts were built by the personnel employed by the District Engineer in Laguna.

(*c*) Two nursery sheds were constructed in the new nursery established last year in close proximity to the Forest School building and one more is at present under construction which will be used for seedlings. Additional nursery beds were constructed in the new nursery in Hectare A and at present we have 94 beds in use.

(*d*) Considerable ornamental planting was done in the neighborhood of the Forest School quarters and around the Forest School building, the idea being to make the campus as attractive as possible.

(*e*) Experience has shown that the ordinary paths used by the students and personnel were unsightly and new ones have been constructed from the quarters to the Forest School road, the borders of which have been planted with ornamental shrubs.

(*f*) Additional collections have been made for the museum, it being the purpose to secure as much material as possible for reference and for the benefit of visitors.

(*g*) The student gardens have been increased so that at present approximately 1½ hectares are devoted to this purpose.

(*h*) The trail from the Forest School to the summit of Mt. Makiling has been repaired and put in good shape.

(*i*) The hut on the top of Mt. Makiling was found to be very rotten and will not stand the weather. It is being reconstructed at present so that it may serve as a shelter for those desiring to stay overnight on the mountain.

(*j*) The repair of the student quarters, Forest School building, and faculty cottages has been carried on as usual so that these buildings are always in good condition. A kitchen was added

to one of the faculty cottages in Hectare C and the other cottage will shortly be equipped likewise.

(*k*) Ornamental plants have been collected for the student houses.

(*l*) The athletic grounds, especially the basket ball court, have been repaired. A new tennis court is now being constructed.

5. COMMENCEMENT

The eleventh annual commencement of the Forest School was held on March 18. Twenty-five Seniors (Class '22) were graduated. The following were the honor men:

Medalist	Constantino Rabaya
First Honor Man	Balbino Viado
Second Honor Man	Andres Lemos

The commencement address was delivered by Secretary of Agriculture and Natural Resources Corpus. The diplomas were presented by Director of Forestry Arthur F. Fischer. Talks were delivered by the Dean of the College of Agriculture and the Dean of the College of Veterinary Science. Wood Technologist Luis J. Reyes represented the alumni. The class day was held on March 17 and consisted of a program in which representatives of the faculty and the junior and the senior classes gave short talks including the class history, class prophecy, etc. A feature of this commencement was the Bonfire held on the night of the class day which was greatly enjoyed by every one present. Notable features of this event were various dances, such as Visayan, Igorot, Negrito, and other native dances.

6. SPECIAL FEATURES

The class of 1922 spent four days in Manila in connection with their course in lumbering, visiting sawmills, lumber yards, and wood-using industries. The preservation plant of the Atlantic Gulf and Pacific Company was also visited.

In connection with the campaign against locusts carried on by the College of Agriculture and the College of Veterinary Science, the Forest School students spent several days during the year in fighting these pests under the direction of the ranger personnel at the Forest School. During the year the students took part in fire prevention work and helped fight a bad cogon fire on the College of Agriculture land which was seriously threatening one of the faculty cottages. Early one morning about one o'clock they were called out to help fight a fire in the

kitchen of one of the cottages belonging to the College of Agriculture. The entire force at the Forest School is organized into six fire companies.

Sanitation and cleanliness of the quarters at the Forest School have been very excellent this year and are in charge of one of the instructors of the school.

The health of the students has been very excellent, in the main, throughout the year. One of the instructors has been taught first aid by the College of Agriculture Physician and handles many cases himself.

The Forest School is gradually becoming well known as a place of interest and a considerable number of visitors spend Sundays and holidays here. Among the notable visitors in the year may be mentioned the following:

Governor-General Leonard Wood; Vice Governor-General Gilmore; Secretary of Agriculture and Natural Resources Corpus; Under Secretary of Agriculture and Natural Resources Apostol; Doctor Mulder, Secretary of Agriculture of the Netherlands East Indies; Dr. Davis of the Hawaiian Sugar Planters' Association; Auditor Fullington; Director of the Bureau of Science, Dr. Merrill; and Mr. Edwards, formerly Director of the Bureau of Agriculture.

In addition various entities visited the Forest School notably, the Conservation League, Far Eastern College, National University, and various schools. The Visayan Club located in Los Baños and consisting of members of the three schools here held a dance at the Forest School mess which was well attended.

7. DEGREE COURSE

Various courses in the degree course were given this year, some of which were taught by the College of Agriculture faculty. This work was given to such rangers as are located here and who had time to take the work, the idea being to get a start in order to develop a series of lectures for this course. It is hoped that this course will be in full swing next year.

8. ALUMNI

Considerable information has been secured concerning the alumni of the Forest School so that the location and profession of pratically every man graduating from the school is at present known. These results were published in a recent issue of the Makiling Echo.

DIVISIONS OF SAWMILLS AND UTILIZATION

With the plan adopted at the beginning of the year of assigning all personnel definitely to some one of the Divisions of the

Bureau, the personnel assigned to the Division of Sawmills and Utilization on December 31, consisted of 1 forester, Chief of Division, 2 foresters, 1 lumber inspector, 35 rangers, 36 guard scalers, and 13 concession guards, the latter employed under the direction of the Bureau at the expense of the licensees.

Of this number the ranger and guard force immediately engaged in sawmill supervison and scaling work consisted of 23 rangers and 33 guards as compared with 22 rangers and 28 guards in 1921, while six additional men were assigned to a special crew for training in lumber grading.

With this small increase in actual scaling personnel regular scaling work was done at 29 mills as compared with 26 mills during 1921 with an increase in total volume of logs scaled and manifested for payment of 40,000 cubic meters.

A comparative statement for the years 1918 to 1922 in log scale, lumber production and sales at mills regularly checked by Government scalers is shown in the following table. The figures for 1918 are for 16 mills only; in 1919, 19 mills; in 1920, 21 mills; in 1921, 26 sawmills; and in 1922, 29 sawmills:

Year	Number of mills	Log scale	Mill tally	Sales	Forest charges
		Cu. m.	*Cu. m.*	*Cu. m.*	*Pesos*
1918	16	241,302.28	167,360.17	155,075.73	₱182,472.60
1919	19	288,340.06	203,221.24	193,455.44	245,524.11
1920	21	314,538.17	223,653.06	222,317.47	270,692.01
1921	26	362,553.84	232,509.40	198,041.19	329,553.84
1922	29	402,562.81	259,674.30	267,373.58	350,887.42

Thus while there were 52 operators of sawmills working directly in connection with Government license areas during 1923 and an equal or proportionately large number during previous years the Bureau has had only sufficient personnel to maintain regular scalers on 25 operations and a fairly constant check on the operations of four other mills, the remainder being subject only to such check of their operations as the field men are able to arrange in their regular inspection trips with practically no actual measurement of the logs by Government scalers, as in the case of most non-sawmill licensees; a system which has, time and again, been proven to be the source of a large loss in revenue for forest products either improperly or not at all manifested.

The results of this situation have been brought out both in previous annual reports and in special letters and memorandums regarding the need of a larger personnel and authority for more direct supervision of the Bureau of Forestry over the manifesting of forest products and enforcement of collection of forest charges.

The great need of sufficient men to handle all measurement and invoicing of forest products is due to the fact that the law requires that all licensees measuring and manifesting their own timber must pay on the full log measurement without any allowance for the various forms of defect which reduce the amount of merchantable lumber obtainable from the log. With this provision of the law, which is correct and necessary, and the shortage of Bureau personnel authorized to make such deductions under the law, which is unnecessary and due wholly to the financial restrictions placed on the Bureau in the appropriations granted to it, there is a natural tendency on the part of licensees, where no forest officer is available to make proper measurements and allowance for defect, to protect themselves from loss by failing to manifest and pay for all logs cut by them. With this inducement to under manifest the timber cut and the further loss through insufficient check of unscrupulous operators the loss to the Government in uncollected forest charges is readily estimated at several times the cost of sufficient additional personnel to maintain an efficient supervision of this work.

The total salary and travel expense cost of the Division of Sawmills and Utilization for the year 1922 was 12 centavos per cubic meter of timber scaled, while the actual cost of scaling was 6 centavos per cubic meter.

The details of cost and timber measured are shown in the following table which shows a total cost of ₱50,274.52 as compared with a gross accrued revenue of ₱367,552.33 or a net revenue of ₱317,277.81.

District—	Logs scaled		Ties and lumber inspected		Costs			Cost per cubic meter	Per cent of cost to revenue	Average gross revenue per cubic meter
	Cubic meter	Forest charges	Cubic meter	Charges	Salary	Expenses	Total			
No. 1	1,044.31	₱1,067.83	.....	.....	₱224.36	₱15.90	₱240.26	₱0.230	22.6	₱1.02
No. 3	7,850.10	7,885.27	.....	.....	225.12	68.50	293.62	.037	3.7	1.00
No. 5	39,281.87	40,509.50	.....	.....	1,227.40	163.60	1,391.00	.035	3.4	1.03
No. 6	19,615.29	21,107.16	5,484.76	₱1,347.36	2,289.40	633.07	2,922.47	.148	13.8	1.07
No. 7	181,452.89	121,671.96	.....	.....	5,466.78	367.02	5,833.80	.032	4.8	.67
No. 8	64,487.74	78,946.39	3,212.84	1,065.05	9,106.69	1,686.56	10,793.25	.159	13.5	1.22
No. 10	6,790.24	7,087.66	.....	.....	421.26	53.47	474.73	.070	6.7	1.04
No. 11	60,352.18	58,424.49	.....	.....	2,840.13	137.99	2,978.12	.049	5.1	.97
No. 13	26,864.13	28,162.05	.....	.....	870.74	113.25	983.99	.037	3.5	1.05
Total	407,738.75	364,862.31	8,697.60	2,412.41	22,671.88	3,239.36	25,911.24	.062	7.0	.895
Manila Office—										
Grading instruction	.....	.....	.....	.....	6,154.83	3,063.29	9,218.12	.022	2.5	.....
Utilization section	.....	.....	606.42	277.61	5,681.54	6.95	5,688.49	.014	1.5	.....
Supervision	.....	.....	.....	.....	8,882.27	574.40	9,456.67	.023	2.6	.....
Total Manila	407,738.75	364,862.31	9,304.02	2,690.02	20,718.64	3,644.64	24,363.28	.058	6.6	.....
Distribution and supervision	.....	.....	.....	.....	31,544.15	3,813.76	35,357.91	.085	9.6	.895
Grand total	407,738.75	364,862.31	9,304.02	2,690.02	43,390.52	6,884.00	50,274.52	.121	13.7	.895

Financial conditions and poor management brought the practical failure and closing out of the licenses of Rosentock Wrentmore and Reynolds, Inc., and the Olutanga Lumber Company while a number of other companies have had serious difficulties but show fair to good prospects of pulling through.

Two new mills were partly installed during the year and will probably be ready for operation about February, 1923, in Palawan and Cotabato Provinces.

The Insular Lumber Company has done considerable work in the improvement of its main line railroad and in the planning ahead and laying out of its railroad and logging operations, while the Negros-Philippine Lumber Company, finding itself practically run into a "cul-de-sac" in its logging operations has spent considerable time in sketching its area and laying out its logging lines for a more normal and continuous operation than has heretofore been practiced.

The Basilan Lumber Company closed and dismantled its plant at Isabela and enlarged its plant at Port Holland where all milling operations are concentrated more conveniently to its logging operations.

The small circular mill of the Zambales Lumber Company was destroyed by fire during the month of April but the Company soon afterwards started construction of a new circular mill on tide water near Masinloc and started operations during November although operations up to the end of the year had been very limited.

In the matter of log scaling at the mills two cases of considerable importance came up during the year. One at the Paysawan plant of the Cadwallader-Gibson Lumber Company is a sharp illustration of the need of more direct supervison than the Chief of Division has time to give to this work. During the absence of the Chief of Division in the United States during 1921, a ranger without much of any previous training in scaling work was assigned to Paysawan and left in charge of the scaling there with too little supervison as the Supervisor acting in charge of the Division spent a large part of his time in the field on other work. Shortly after the return of the undersigned, the ranger at Paysawan was dropped for various reasons and an investigation of the scaling work there showed absolute incompetence and neglect on the part of the ranger with the result that the Company was heavily overcharged for the timber cut by them.

The second case in connection with the Insular Lumber Company was the outgrowth of the constant dissatisfaction there has

been with the scaling on the log cars at that mill on the part of both the Company and the scalers. Although the actual results of the scale had never given any cause for complaint from the Company, there had been a series of complaints from the various new superintendents brought out by the Company because of the rapidity with which the scaling was done and counter complaints from the scalers because the Superintendents refused to instruct the train crews to allow them sufficient time to properly scale the logs on the cars.

Scaling at various other points were tried in previous years without giving good results and as it is the opinion of the undersigned that all scaling should be done directly in the cutting areas except where shortage of scaling personnel and the scattered nature of the areas prohibits it, this system was adopted on the Insular operation during April of the past year, and on the areas of the Smithland Sawmill during May. On the smaller operation of the Smithland Sawmill the change was made with entire satisfaction and while there has been some difficulty met with in establishing the work on the large operations of the Insular Lumber Company, the undersigned is confident that the system will prove successful and be more satisfactory generally than the old system of scaling at the mill with periodic inspections and scale of abandoned timber in the cutting areas. As opportunity permits it is planned to introduce this system of scale on the other areas where the system of operation and number of scalers permit.

GRADING

While nothing practical has so far resulted from efforts to induce local lumbermen to organize and adopt a uniform standard of lumber grades with rules and trained inspectors for classifying all lumber placed on the local and foreign markets the Bureau has continued to receive inquiries of the possibility of securing government inspectors as well as a number of requests for actual inspection. In order to continue its policy of preparing a corps of men properly trained in this class of work to demonstrate the value of lumber grading and to meet demands for inspection, the position of lumber inspector was refilled on June 1, with the approval of the Council of State after having been vacant for some time, owing to the heavy demand for ranger personnel in other lines of work.

With the reappointment of the lumber inspector six rangers were sent out in the field under his direction for a thorough training in this work. It had been hoped that at least one

more crew could be trained during the coming year in order to have an adequate number of men stationed at convenient points throughout the country available for the work and to help balance the loss which invariably follows the special training of personnel without adequate provision to increase their pay commensurate with their greater ability and the consequent attraction in higher pay offered by private concerns who wish to have their services.

However with the cuts in appropriation indicated by the work of the budget committees and legislature for 1923, it appears doubtful whether expense funds will be sufficient to more than partially complete the training of the present crew and further work in preparing a competent grading crew will have to be postponed once more.

During 1922 the Bureau received requests for and made inspections for identification, merchantable quality and volume of 495,533 board feet of lumber and 284,519 cubic feet of ties which brought total returns from inspection fees and inspectors expenses of ₱3,175.36 at a cost of some ₱500 or a net revenue to the Government of ₱2,675.36.

But more than the direct net return in inspection fees to the Government which, on an established basis of inspection by properly paid and thoroughly trained inspectors, should not be proportionately so large as indicated above, the value of this service in providing a competently trained and impartial inspector in whom both purchaser and seller have reason to feel confidence is the point desired to be made in this work while the charges are only intended to cover the cost of doing the work with a small margin as a return for the service.

The steadily increasing production of lumber and the capacity of Philippine forests to produce more makes necessary the development of a greater export trade to dispose of the surplus lumber which the local markets can not absorb. To develop this trade the old system of "caveat emptor," which has prevailed practically to the present time in the local markets must give place to a modern responsible system of shipments guaranteed to contain the specified quality of lumber requested by the purchaser.

There have been several instances of shipments of Philippine lumber to foreign ports which have been made on requests for firsts and seconds export grades that have proved to be, on delivery, so absolutely below grade that they had to be either largely or entirely rejected. The continuation of practices such as this by irresponsible dealers reacts on the foreign lumber

markets for Philippine hardwoods in a manner that will require great loss and a long time to overcome and unless the lumbermen take some joint action to control this business, it is advisable that a law be passed prohibiting the exportation of lumber that has not been officially inspected and certified as to its quality and condition for the benefit of the purchaser and the protection and advancement of the export lumber trade.

MARKETS

In spite of complaints from various lumbermen about poor markets and low prices for lumber, there has been a very active movement of lumber during the year as indicated by the column under sales in the table given in the previous section. The former high percentage of timber going into the market in the form of round or squared timber or hand sawn lumber is being greatly reduced as indicated by the fact that while the total amount of timber manifested from the public forest under commercial licenses was reduced from 654,000 cubic meters in 1921 to 630,000 cubic meters in 1922, the total scale of logs at sawmills increased from 363,000 cubic meters in 1921 to over 400,000 cubic meters in 1922.

The increasing distribution of sawmills through the Islands together with the local distribution of lumber by owners of small sailboats and paraos investing in lumber transportation and trading is gradually increasing the use of mill sawn lumber in outlying districts formerly out of touch with the old lumber trading centers.

The following tables show by species and ports the amount of lumber sold during 1921 and 1922 by the principal mills operating on Government forests from which regular and fairly prompt reports are received:

Lumber shipments by twenty-one companies, January 1 to December 31, 1292

Destination	Red lauan and tangile	White lauan	Apitong	Guijo	Mangachapui	Lumbayao	Yacal	Palosapis	Miscellaneous				Total
									First Group	Second Group	Third Group	Fourth Group	
United States	3,738,348	1,232,560	1,377.955	308,569	.....	.....	.....	.....	1,211	.....	2,007	158,264	6,818,914
England	50,769	45,462	73,044	.....	.....	16,224	.....	.....	.....	.....	.....	.....	185,499
Australia	296,979	226,157	3,458	87	.....	10,227	72	.....	.....	.....	.....	105,277	642,257
Africa	3,979	4,784	.....	.....	.....	5,046	.....	.....	.....	.....	.....	.....	13,809
Shanghai	1,092,437	2,004,327	434,621	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,531,585
Hongkong	1,749,110	89,102	1,581,550	4,398	.....	.....	.....	7,006	182	.....	.....	.....	3,431,348
Japan	12,468	21,745	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34,213
Singapore	4,853	586	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,439
Manila	20,857,481	22,188,450	17,500,372	2,482,649	372,935	1,286,639	2,924,383	276,609	560,255	192,132	392,369	2,219,828	71,254,102
Luzon Ports	514,238	1,165,477	5,822,404	414,882	1,745	.....	157,219	399,237	19,909	3,690	708,478	1,466,929	10,674,208
Cebu	904,806	1,000,129	1,037,113	84,006	12,111	362,712	62,987	96	5,693	.....	1,425	255,167	3,726,245
Iloilo	706,243	1,390,242	167,424	94,217	11,424	19,671	223,956	11,216	7,239	25,193	21,726	.....	2,678,551
Visayan Ports	1,723,482	1,340,214	613,594	17,497	.....	91,718	7,138	.....	617	.....	50,230	301	3,844,791
Zamboanga	143,750	187,697	221,258	140,918	24,415	732,081	143,858	.....	49,809	12,907	37,699	206,517	1,900,909
Davao	9,955	10,282	.....	.....	.....	2,938	.....	.....	.....	.....	3,805	1,333	28,313
Mindanao and Sulu ports	425,528	422,492	235,286	87,254	2,990	89,955	55,651	.....	15,315	16,605	48,482	506,797	1,906,355
Total	32,234,426	31,329,706	29,068,279	3,634,477	425,620	2,617,211	3,575,264	694,164	660,230	250,527	1,266,221	4,920,413	110,676,538
Mill tally	32,230,491	27,935,164	26,814,273	2,804,722	484,844	2,271,928	2,852,524	966,304	871,833	676,314	2,857,582	1,640,227	102,406,206

Lumber shipments by twenty-one lumber companies, January 1 to December 31, 1921

Destination	Red lauan and tangile	White lauan	Apitong	Guijo	Manga-chapui	Lumbayao	Yacal	Palosapis	Miscellaneous				Total
									First Group	Second Group	Third Group	Fourth Group	
United States	1,906,861	1,361,916	448,810	182,564	.....	2,018	.....	30,563	.....	.....	.....	53,033	3,985,765
Africa	7,657	5,399	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,056
Australia	336,797	199,613	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	536,410
England	66,101	32,827	.....	.....	.....	30,054	.....	.....	.....	.....	.....	.....	128,982
Shanghai	1,445,388	1,044,674	180,024	.....	.....	46,288	.....	.....	.....	.....	.....	.....	2,716,374
Manila	12,062,736	17,595,805	12,663,158	1,976,701	258,654	1,776,920	1,515,118	352,655	416,117	144,825	1,455,545	4,458,860	54,676,094
Luzon ports	272,744	424,508	557,462	60,453	7,134	32,811	3,053	150,541	16	1,029	582,014	1,994,811	4,086,576
Cebu	1,180,340	949,514	1,542,656	151,213	30,362	354,113	157,506	.....	2,698	1,500	4,989	686,861	5,061,752
Iloilo	1,021,230	1,035,722	452,798	20,761	7,403	12,713	19,721	.....	252	89,816	68,850	.....	2,679,246
Visayan ports	3,147,172	153,108	1,061,975	28,076	2,393	37,990	9,691	.....	201	.....	456,640	872,585	5,769,931
Zamboanga	352,964	317,975	208,968	76,780	9,322	349,782	113,718	.....	18,622	3,007	49,829	301,319	1,802,286
Davao	50,162	11,191	10,806	.....	.....	.....	897	.....	.....	.....	1,613	.....	74,669
Mindanao and Sulu ports	684,092	312,750	170,095	83,127	15,056	83,291	59,439	.....	15,904	2,248	14,218	81,502	1,521,922
Total	22,534,244	23,445,002	17,296,752	2,579,675	330,324	2,725,980	1,879,143	533,759	453,890	192,025	2,633,798	8,448,471	83,053,063
Mill tally	32,416,640	26,586,865	20,931,782	3,474,489	480,205	2,167,043	2,899,314	858,443	870,464	866,160	3,702,631	2,132,194	96,886,203

The quantities shown above are board feet.

In addition to this amount, the smaller mills on which checks of operation are very irregular due to lack of personnel together with the mills in Manila purchasing their logs from small licensees are estimated to have cut and sold some 12,000,000 board feet making a total sale during 1922 of about 120,000,000 board feet of mill sawn lumber of which 18,000,000 board feet were exported to foreign countries.

FOREIGN MARKETS

With the depressed condition of the local markets during 1921, there was a greater realization of the necessity for the development of an export business to dispose of the increasing amount of lumber being cut. This, together with increased business of the companies which have been exporting for some time, resulted in a large increase in exports from 11,790,000 board feet in 1921 to 18,298,000 board feet in 1922.

The following tables show a comparison of the total export and import lumber trade for the past four years:

Lumber and timber exported from the Philippine Islands

Species	1922 (January to December)			1921 (January to December)			1920 (January to December)			1919 (January to December)		
	Cu. m.	Bd. feet.	Value	Cu. m.	Bd. feet.	Value	Cu. m.	Bd. feet.	Value	Cu. m.	Bd. feet.	Value
United States:												
Narra timber				106	44,944	₱6,450						
Miscellaneous timber				18	7,632	1,101						
Narra lumber			₱80									₱50
Tangile lumber	4,340	1,840,160	220,450	1,898	804,752	150,663	6,875	2,915,000	₱557,388	3,515	1,490,360	260,207
Almon lumber	643	272,632	27,226	2,352	997,248	124,843	1,892	802,208	111,877	459	194,616	18,504
Lauan lumber	12,039	5,104,536	450,105	4,576	1,940,224	438,892	10,014	4,245,936	446,879			
Guijo lumber	304	128,896	14,650									
Apitong lumber	1,701	721,224	56,532									
Miscellaneous lumber	213	90,312	9,134	400	169,600	21,201	43	18,232	3,077	4,836	2,050,464	251,840
Total	19,240	8,157,760	778,177	9,350	3,964,400	743,150	18,824	7,981,376	1,119,221	8,810	3,735,440	530,601
Hongkong:												
Miscellaneous timber	23	9,752	2,443				48	20,352	1,000	252	106,848	5,912
Narra lumber	1	424	163									
Almon lumber	287	121,688	10,000	40	16,960	1,865	88	37,312	2,436			
Lauan lumber	218	92,432	7,939	158	66,992	6,281	501	212,424	19,169			
Guijo lumber	150	63,600	10,621									
Apitong lumber	2,548	1,080,352	71,892									
Miscellaneous lumber	452	191,648	33,850	2,214	938,736	87,388	416	176,384	37,324	1,278	541,872	52,572
Total	3,679	1,559,896	136 908	2,412	1,022,688	95,534	1,053	446,472	59,929	1,530	648,720	58,484
China:												
Narra timber			18							3	1,272	360
Guijo timber	29	12,296	2,699									
Tangile timber	9	3,816	550									
Miscellaneous timber	7	2,968	697				1	424	250	43	18,232	5,050
Narra lumber	22	9,328	2,104	1	424	150						
Tangile lumber	52	22,048	1,982	130	55,120	16,815	24	10,176	3,714	525	226,840	17,890
Almon lumber	164	69,536	4,081	768	325,632	33,498						
Lauan lumber	9,788	4,150,112	285,896	7,800	3,307,200	276,941	5,900	2,501,600	247,608			
Guijo lumber	156	66,144	11,094									
Apitong lumber	1,334	565,616	40,905									
Miscellaneous lumber	38	16,112	2,486	1,463	620,312	75,075	2,361	1,001,064	103,698	4,111	1,743,064	147,139
Total	11,599	4,917,976	352,512	10,162	4,308,688	402,479	8,286	3,513,264	355,270	4,690	1,989,408	170,439

Lumber and timber exported from the Philippine Islands—Continued

Species	1922 (January to December)			1921 (January to December)			1920 (January to December)			1919 (January to December)		
	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value
Japan:												
Narra timber	3	1,272	₱171				1	424	₱150			
Tangile timber	3	1,272	113									
Miscellaneous timber	25	10,600	1,001			₱40	21	8,904	4,118	90	38,160	₱1,982
Narra lumber	33	13,992	2,992	4	1,696	312			11			100
Tangile lumber	137	58,088	4,859			12				5	2,120	500
Almon lumber	107	45,368	2,183									
Lauan lumber	243	103,032	7,259	105	44,520	4,893						
Guijo lumber	2	848	146									
Apitong lumber	3	1,272	174									
Miscellaneous lumber	111	47,064	10,022	63	26,712	1,251	15	6,360	5,582	7	2,968	1,146
Total	667	282,808	28,920	172	72,928	6,508	37	15,688	9,861	102	43,248	3,728
Australia:												
Tangile lumber	628	266,272	24,437	38	16,112	2,252	117	49,688	10,301	22	9,328	1,677
Almon lumber	2,677	1,135,048	141,259	2,644	1,121,056	152,852	1,102	467,248	57,285	446	189,104	18,812
Lauan lumber	2,677	1,135,048	111,365	1,710	725,040	81,358	480	203,520	25,850			
Apitong lumber	2	848	101									
Miscellaneous lumber	390	165,360	20,699	85	36,040	4,464				99	41,976	6,296
Total	6,374	2,702,576	297,861	4,477	1,898,248	240,926	1,699	720,376	93,436	567	240,408	26,785
United Kingdom:												
Narra lumber							1	424	192			
Tangile lumber	337	142,888	16,741	195	82,680	18,386	793	336,232	58,764			
Lauan lumber	333	141,192	21,682	799	338,776	50,669	1,168	495,232	76,913			
Apitong lumber	159	67,416	5,275									
Miscellaneous lumber	156	66,144	5,622	128	54,272	10,139	459	194,616	34,777			
Total	985	417,640	49,320	1,122	475,728	79,194	2,421	1,026,504	170,646			
Canada:												
Almon lumber							94	39,856	6,000			
Lauan lumber							203	86,072	12,538			
Miscellaneous lumber										362	153,488	14,964
Total							297	125,928	18,538	362	153,488	14,964

British East Indies:												
Miscellaneous timber							7	2,968	720	2	848	300
Tangile lumber				2	848	173						
Apitong lumber	225	95,400	6,636									
Lauan lumber	36	15,264	1,072									
Miscellaneous lumber				24	10,176	2,296	13	5,512	1,711			
Total	261	110,664	7,708	26	11,024	2,469	20	8,480	2,431	2	848	300
British Africa:												
Lauan timber	21	8,904	677									
Miscellaneous timber	12	5,088	588									
Lauan lumber							46	19,504	3,000			
Total	33	13,992	1,265				46	19,504	3,000			
Singapore:												
Lauan lumber	13	5,512	450	43	18,232	2,827						
Netherlands:												
Tangile lumber				1	424	102						
Lauan lumber				7	2,968	161						
Total				8	3,392	263						
Netherlands Indies:												
Miscellaneous lumber										4	1,696	126
Guam:												
Tangile lumber				6	2,544	400						
Apitong lumber	219	92,856	9,792									
Lauan lumber							10	4,240	1,000			
Miscellaneous lumber	22	9,328	2,500	26	11,024	864						
Total	241	102,184	12,292	32	13,568	1,264	10	4,240	1,000			
Hawaii:												
Lauan lumber				3	1,272	50						
Spain:												
Narra timber	4	1,696	335									
Apitong timber	2	848	92									
Miscellaneous timber	11	4,664	944									
Narra lumber	1	424	71				1	424	550			
Tangile lumber	6	2,544	292									
Miscellaneous lumber	8	3,392	563						415			
Total	32	13,568	2,297				1	424	965			

Lumber and timber exported from the Philippine Islands—Continned

Species	1922 (January to December)			1921 (January to December)			1920 (January to December)			1919 (January to December)		
	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value
Germany:												
Narra lumber	1	424	₱205									
Miscellaneous lumber			25									
Total	1	424	230									
To all countries:												
Narra timber	7	2,968	524	106	44,944	₱6,450	1	424	₱150	3	1,272	₱360
Tangile timber	12	5,088	663									
Guijo timber	29	12,296	2,699									
Apitong timber	2	848	92									
Lauan timber	21	8,904	677									
Miscellaneous timber	78	33,072	5,673	18	7,632	1,141	77	32,648	6,088	387	164,088	13,244
Total timber	149	63,176	10,328	124	52,576	7,591	78	33,072	6,238	390	165,360	13,604
Narra lumber	58	24,592	5,615	5	2,120	462	2	848	753			150
Tangile lumber	5,500	2,332,000	268,761	2,270	962,480	188,803	7,809	3,311,016	630,167	4,077	1,728,648	280,274
Almon lumber	3,878	1,644,272	184,749	5,804	2,460,896	313,058	3,176	1,246,624	177,598	905	383,720	37,316
Lauan lumber	25,347	10,747,128	885,768	15,201	6,445,224	862,072	18,522	7,768,528	832,957			
Guijo lumber	612	259,488	36,511									
Apitong lumber	6,191	2,624,984	191,307									
Miscellaneous lumber	1,390	589,360	84,901	4,403	1,866,872	202,678	3,307	1,402,168	186,584	10,697	4,535,528	474,083
Total lumber	42,976	18,221,824	1,657,612	27,683	11,737,592	1,567,073	32,616	13,829,184	1,828,059	15,679	6,647,896	791,823
Grand total	43,125	18,285,000	1,667,940	27,807	11,790,168	1,574,664	32,694	13,862,256	1,834,297	16,069	6,813,256	805,427

Lumber and timber imported into the Philippine Islands

Species	1922 (January to December)			1921 (January to December)			1920 (January to December)			1919 (January to December)		
	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value
From United States:												
Ties				5,023	2,129,752	₱205,732						
Cedar timber										389	164,936	₱5,924
Miscellaneous timber	5	2,120	₱40	63	26,712	2,588	121	51,304	₱2,149	36	15,264	2,670
Pine lumber	2,943	1,247,832	79,690	1,043	442,232	56,864	2,545	1,079,080	110,172	4,612	1,955,488	247,345

Redwood lumber	44	18,656	3,377	1,123	476,152	89,568	851	360,824	55,185	871	369,204	30,833
Cedar lumber	168	71,232	6,539				270	114,480	11,164	37	15,688	2,355
Cedar box shooks			8,371			18,000						
Oak lumber	24	10,176	2,348									
Miscellaneous lumber	9	3,816	79	12,979	5,503,096	374,679	9,687	4,107,288	451,662	6,657	2,822,568	242,285
Total	3,193	1,353,832	100,444	20,231	8,577,944	747,431	13,474	5,712,976	630,332	12,602	5,343,248	531,412
From Canada:												
Cedar timber				225	95,400	7,760						
Miscellaneous timber							69	29,256	1,743			
Pine lumber	224	94,976	4,738				358	151,792	10,409			
Cedar lumber				164	69,536	3,588						
Miscellaneous lumber				3,676	1,558,624	100,749	3,231	1,369,944	82,147	1,062	450,288	43,719
Total	224	94,976	4,738	4,065	1,723,560	112,097	3,658	1,550,992	94,299	1,062	450,288	43,719
From Hongkong:												
Miscellaneous timber							6	2,544	237			
Cedar lumber							614	260,336	12,283			
Total							620	262,880	12,520			
From China:												
Miscellaneous timber			272	19	8,056	3,507	2	848	22	3	1,272	53
Miscellaneous lumber	35	14,840	827	424	179,776	17,174	142	60,208	4,044	29	12,296	510
Total	35	14,840	1,099	443	187,832	20,681	144	61,056	4,066	32	13,568	563
From Japan:												
Miscellaneous timber				8	2,592	75						
Miscellaneous lumber			14	26	11,024	189			4	30	12,720	212
Total			14	34	13,616	264			4	30	12,720	212
From United Kingdom:												
Miscellaneous timber				7	2,968	146						
From Australia:												
Miscellaneous timber				22	9,328	1,215						
Miscellaneous lumber				233	98,792	18,134						
Total				255	108,120	19,349						
From British East Indies:												
Miscellaneous timber				45	19,080	1,592	111	47,064	1,516	44	18,656	1,339
Miscellaneous lumber	765	324,360	7,990	346	146,704	36,366	435	184,440	16,063	343	145,432	13,923
Total	765	324,360	7,990	391	165,784	37,958	546	231,504	17,579	387	164,088	15,362

Lumber and timber imported into the Philippine Islands—Continued

Species	1922 (January to December)			1921 (January to December)			1920 (January to December)			1919 (January to December)		
	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value
From French East Indies:												
Miscellaneous timber										3	1,272	₱96
Miscellaneous lumber	6	2,544	₱326	116	49,184	₱832	13	5,512	₱32	7	2,968	239
Total	6	2,544	326	116	49,184	832	13	5,512	32	10	4,240	335
From Spain:												
Miscellaneous lumber							31	13,144	1,302			
From Dutch East Indies:												
Miscellaneous timber	49	20,776	160									
From Netherlands:												
Cedar box shooks									1,596			
From Germany:												
Miscellaneous lumber										29	12,296	556
From Guam:												
Miscellaneous lumber							2	848	200			
From Argentina:												
Lignum Vitæ	48	20,352	2,092									
From all countries:												
Ties				5,023	2,129,752	205,732						
Cedar timber				225	95,400	7,760				389	164,936	5,924
Miscellaneous timber	54	22,896	472	142	59,408	7,908	309	131,016	5,667	86	36,464	4,158
Cedar lumber	168	71,232	6,539	164	69,536	3,588	884	374,816	23,447	37	15,688	2,355
Cedar box shooks			8,371			18,000			1,596			
Pine lumber	3,167	1,342,808	84,428	1,043	442,232	56,864	2,903	1,230,872	120,581	4,612	1,955,488	247,345
Redwood lumber	44	18,656	3,377	1,123	476,152	89,568	851	360,824	55,185	871	369,304	30,833
Oak lumber	24	10,176	2,348									
Lignum Vitæ lumber	48	20,352	2,092									
Miscellaneous lumber	815	345,560	9,236	17,800	7,547,200	548,123	13,541	5,741,284	555,454	8,157	3,500,968	301,444
Total	4,320	1,831,680	116,863	25,520	10,819,680	937,543	18,488	7,838,912	761,930	14,152	6,000,448	592,059

It may be noted that there has been a steady increase which is fairly rapid in the export of lumber to Australia and as the lauans, which form a large part of these exports, is somewhat similar to Queensland Maple in appearance and uses, there has evidently been a move on the part of Australian lumbermen to combat the competition from this source as this office received clippings from the Sydney Morning Herald printing accounts of protests made against the importation of logs and lumber from Borneo, the Philippines, and other "Pacific Islands" due to the fact that they were infested with wood-boring beetles and that there was grave danger of these beetles being introduced into, and destroying the native trees of, Australia.

The agitation culminated in a government embargo at the end of the year, together with the quarantining and return to Manila of a shipment of lauan in which pinholes were found.

While prompt action on the part of the Bureau in securing and furnishing the Government officials responsible for the embargo in Australia with information regarding the habits of pinworm beetles and the absence of the insects from sawn and seasoned lumber, this case in which lumber was shipped to a foreign port without any attempt to grade and classify it other than simply as Philippine lauan indicates the need of standard grades and inspection of all export shipments and the damage that may be done to the export lumber trade by indiscriminate shipments to people who may be expecting to receive high grades and who find on arrival of their orders that they have been furnished with poorer grades.

There is no doubt but that there is a market in Australia and other countries for lumber which has pinworm holes in it but it should be sold and shipped as wormy stock and not mixed indiscriminately with high grade stock to purchasers who have ordered and paid for lumber with the expectation of receiving the best grades.

This case has also shown the need for more investigation work on insects or other agencies affecting lumber as the information which has so far been gathered relative to the identification and life histories of the various wood destroying beetles is very meager and at the time this Australian case arose it was necessary to make a special request for the assignment of the entomologist from the Bureau of Science to make a special trip to the mill affected for the purpose of securing what data he could in the course of a brief investigation of the character and habits of these insects, before any action could be taken toward counteracting the effects of the campaign against

Philippine lumber in Australia. Collections of insects and fungi attacking wood have been made to a certain extent by forest officers but men occupied with the numerous administrative duties for which the field force is called upon can not perform the detailed observation and collecting work necessary for the efficient carrying out of this class of work and men especially fitted for making such studies are needed by the Bureau.

The very considerable increase in the shipments to the United States is indicative of the favor Philippine woods are meeting on the American market and with the tentative shipments recorded to European markets as well as the increases to various oriental countries, it is to be hoped that the export trade of Philippine lumber will be well developed during the coming year.

UTILIZATION SECTION AND WORKING COLLECTION

This section is in charge of studies of the utilization of wood and minor forest products as well as the working collection of the Bureau. It is also in charge of propaganda and extesion work along lines of utilization. The following are the principal accomplishments of the Section during last year:

Wood Preservation.—This section is in direct coöperation with the Atlantic, Gulf & Pacific Company in the treatment of native timbers. A keen interest along this line is apparent in large consumers of wood, such as, sugar centrals and railroad companies, and, of course, the lumbermen. With one ranger continually detailed at the wood preservation plant of the company, it is possible for the Bureau to keep track of the various timber treated and the kind and amount of preservative injected into the wood. These data, as will be seen below, are indispensable in the durability tests which this section maintains. One sugar central has purchased several thousand apitong ties and piles treated with water gas tar, the Bureau of Public Works ordered apitong paving blocks for the pavement of the floor at Pier 7, while Fort Mills at Corregidor has ordered about 500 treated apitong railroad ties as a trial order. A number of treated samples have been sent to various sugar centrals and records of durability of these are now being made. Several samples of treated apitong were also sent to different railroad companies in China for trial. There were treated in all, in coöperation with this Bureau, over 18,600 cubic feet of ties and structural timber.

The study of the anatomical structure of wood has been started this year. This work is being conducted in coöperation

with the Department of Botany of the University of the Philippines inasmuch as this institution has the necessary apparatus for this class of work. Typical authentic specimens of the more important Philippine woods have been selected and small blocks were cut from them for histological preparation. The samples have been boiled and softened in acid and are now ready for sectioning.

The studies of the bending qualities of native woods have not progressed to any appreciable extent due to inability to secure funds for the purchase of a cylinder and other necessary appliances for wood bending expirements. It was thought later, however, that this work could be best done in coöperation with the Bureau of Science which is better equipped to do this work.

The mechanical properties of native commercial woods are now under investigation in coöperation with the Bureau of Science. In 1903, the mechanical properties of native woods were studied, but the test pieces were unauthenticated, often of unknown origin, and furthermore, the grades of timber then available were somewhat different from those now obtainable in the lumber market due to the fact that modern methods of lumbering and milling have made it possible to bring to market higher grades of timber than were formerly obtainable with the crude methods of lumbering then in vogue. The early investigations on the mechanical properties of lumber have, nevertheless, been of assistance in the utilization of native woods. These tests were partly responsible in inducing the military authorities to use the lauans as a substitute for Oregon pine for it was shown that the mechanical properties of most lauans are superior to those of Oregon pine. Since the time when the first tests of native woods were made, the United States Forest Products Laboratory at Madison, Wisconsin, has improved on the methods of timber testing and as most of the testing machines used by the Forest Products Laboratory and the method of testing are the same as those we employ here it will thus make it possible to gain a fairly good knowledge of mechanical properties of native timbers as compared with those of the United States. The local lumbermen are willingly coöperating by donating all the timbers needed for this project.

Charcoal making was given attention the past year. This kind of fuel is being used more and more by the people of Manila and in the provinces for domestic purposes. An especially designed stove for burning charcoal introduced by the Japanese

has made cooking with charcoal about as cheap as ordinary wood fuel, and it has the added advantage of being cleaner, easier to handle, and much less chance of causing fires. Ranger C. Rabaya who was in charge of the charcoal kilns at the Forest School and Ranger F. Manuel who has manufactured charcoal on a commercial scale are in charge of charcoal production studies. A number of requests for information on how to construct and operate Japanese charcoal kilns have been received, and to answer these requests Ranger C. Rabaya prepared a paper on charcoal making by the Japanese process. This paper is now ready for publication.

Identification.—As usual, numerous samples have been received in this section for identification from forest officers, internal revenue agents, lumbermen and from the wood using industries. The larger companies and salesmen interested in outside markets have either purchased or submitted samples to be identified and certificated before sending them abroad to prospective purchasers of Philippine lumber. Heretofore some lumbermen have sent wrongly labeled specimens to parties abroad thus causing confusion when actual shipments were made.

A number of controversies were settled between lumbermen and wood users as regards the identity of certain species. These people have, of late years, called on the Bureau of Forestry to settle any controversy on the identity of species. In order to help forest officers and other parties in the identification of woods, there was prepared in this section a guide for the identification of Philippine woods. This paper is ready for the press, but due to lack of funds its publication has been postponed. It is hoped, however, that enough money will be available this year to make its publication possible.

Extension Work and Propaganda.—There is a marked increase in the number of requests from abroad for information about Philippine woods and minor forest products. Philippine woods are now regularly quoted in the leading lumber trade journals of America and have attracted the attention of manufacturers and builders using fancy woods, such as, genuine mahoganies and other tropical woods. As the qualities of Philippine lumber becomes better known abroad, there is a noticeable increase in the use of native woods for a number of articles for which only genuine mahogany was employed. Native woods are now employed in the United States and other countries abroad in the manufacture of high grade furniture, musical instruments, scientific instrument cases, and other uses for which high grade woods are required. This is due to the fact that not

only do our softer dipterocarps ("Philippine mahogany") have a beautiful figure and color but the careful tests conducted by the Forest Products Laboratory at Madison, Wisconsin, in order to determine the mechanical properties of tangile in comparison with genuine and African mahoganies, have shown that "in most of its mechanical properties the tangile tested is the equal of true mahogany." It might be stated in this connection that tangile belongs to the class of lumber called, "lauans," to which also belong red lauan, almon, bagtikan, and white lauan whose mechanical properties are very similar to tangile. The lauans constitute the greater percentage of lumber exported and are the most abundant class of timber in the Islands.

There has been a continued quest from Japan for woods suitable for the manufacture of wooden shoes. Soft, light colored woods are wanted and the following woods were recommended: kupang, taluto, gubas, dita, tanag, tuwi, anabiong, the light colored lauans of the malaanonang type and binuang. Samples of some of these woods large enough to be made into Japanese wooden shoes were sent to Japan for trial and were found to be wholly satisfactory for the purpose. It was learned later that several concerns have made contracts with lumber concerns in the Islands for the supply of one or more of the above-named species.

During this year about 400 students from public and private high schools visited the working collection of the Bureau. The students were given a general talk on forests and forestry as well as the most important products derived from the public forests of these Islands.

The Working Collection.—There has been a change in the arrangements of log and plank specimens in the working collections. Stands for log and plank specimens were made and those specimens belonging to the same family were placed as near each other as possible. The shelf and hand specimen cases which contain valuable collection of woods were provided with sliding glass doors which keep the specimens almost dust proof. The minor forest products were also grouped as closely as possible but there are still equipments needed.

A collection of the more common termites (white ants) was donated to the working collection by Professor Light, formerly of the University of the Philippines. Three of these termites of the genera *Coptotermes, Planocryptotermes,* and *Cryptotermes* cause the failure of many wooden structures. A number of wood boring beetles have been collected during the year and

forwarded to the Bureau of Science. As soon as these are mounted and identified, duplicate specimens will be furnished the Bureau for the working collection. A few wood destroying fungi have been added to the collection.

There were collected last year 218 botanical specimens, 50 of which were accompanied by wood samples. There were 185 additions to log sections and trade samples and 38 planks, many of which were either new to the collection, or were better samples than those already in the collection. Fifty-four specimens were added to the collection of foreign woods.

The Atlantic, Gulf & Pacific Company donated to the Bureau 15 apitong railroad ties and 24 paving blocks of various species, treated with varying amounts of preservatives.

A roll of gogo vine, two jars of pili resins, six rolls of gutta-percha, and one big sample of daluro were added to the minor products collection.

During the year there were 970 specimens sold, 2,004 distributed gratis to private parties, 1,043 furnished forest stations, and 4,320 to the Forest School, the majority of which are distributed to members of the senior class of the Forest School.

Durability Test.—This section is in charge of durability tests conducted in coöperation with private institutions. The greater bulk of the durability tests studies are conducted by the Division of Investigation. The durability tests of some fourteen species of commercial timbers for railroad ties conducted in coöperation with the Philippine Railway Company at Panay is nearing completion; only the more durable ties such as, ipil, molave, akle, yakal, and a few others are still in the testing grounds, but even of these we have now a good idea of their durability because over 25 per cent of the ties of all the above species have already been removed.

The durability tests for piling conducted in coöperation with the Quartermaster Corps of the U. S. Army at Pier 1 is giving profitable results. While it is true that the tests have only been in progress for a little over a year, they were sufficient to demonstrate that malabayabas (*Tristania* sp.) is a very resistant wood against the inroads of marine wood borers. This wood is probably a better wood for this purpose than dungon (*Tarrietia sylvatica*) or aranga (*Homalium* sp.), two of the best known but rarer woods, suitable for salt water piling.

Thirty-six railroad ties treated with varying amounts of water gas tar were sent to different sugar centrals and a record is kept of them in order to determine their durability. This number is altogether too small and for this reason there is planned for

this year a more thorough test on a much larger number of samples treated with various kinds and amounts of preservatives. This work will be done in coöperation with the Philippine Sugar Central Agency. About 2,500 paving blocks are now under observation for durability and mechanical wear. These blocks were treated with water gas tar at the Atlantic, Gulf & Pacific Company and donated to the City of Manila, where they were laid on a street bearing heavy traffic in the walled city.

There were prepared in this section about 100 standard durability test pieces of commercial woods to be tested for durability by the Department of Forest Pathology at the College of Agriculture at Los Baños, Laguna.

Carpentry Shop.—The small shop which the section maintains prepares the specimens in the working collection and does minor repairs to furniture and equipment of the Bureau. The men of the shop did the carpentry work in the installation of the Bureau's exhibits in the carnival. The making of stands for the working collection, preparation of specimens, and the work of making sliding glass frames for the shelf and hand specimen cases were all done by the carpenters in the shop. Besides these the shop made 12 shelves for hand specimens, 2 big shelves in the vault, 4 forester's desks, 1 octagon show case for minor forest products, made 5,473 hand specimens, prepared 57 museum planks, and 85 logs or floor specimens and did numerous small jobs.

DIVISION OF FOREST LANDS AND MAPS

No radically new line of work was initiated in this Division during the year, but along certain lines the amount of routine work was increased notably.

The force of this Division at the end of the year consists of the following field and office force: 2 foresters, 1 assistant forester (pensionado in the United States), 1 forest surveyor, 3 forest supervisors, 33 rangers, 1 forest guard, 11 draftsmen, 4 clerks, and 1 messenger.

Depending upon the personnel and the allotment for the traveling expenses which may be given to this Division, the plan of coöperation with the Bureau of Lands for the coming year is to give preferential attention to clearing up the accumulated numerous applications for public lands still pending under the Public Land Act No. 926. For this purpose, various parties will be distributed in all the regions where there are at present a great number of such applications, and using the extensive system of land classification, the boundaries between forest zones

and regions alienable and disposable will be simultaneously established, in order to determine at the same time which applications should be certified for agricultural or for forest purposes. These areas will be mapped out with more details as regards topography and also the names of the sitios and barrios in order to furnish more information to the Bureau of Lands for the future disposition and management of the areas classified and certified to as alienable and disposable.

In connection with this work attention will also be given to the necessary rectification of boundaries of communal forests and to the establishment of new parcels, if necessary, in order that the location of the parcels may be just as convenient as possible to the residents of the town.

The special work proposed for the coming year is to make an accurate survey of the forest reserve of Mts. San Cristobal and Banahao in the Provinces of Tayabas and Laguna, respectively, in order to apply for its registration. This reserve made after an approximate survey was established by Proclamation No. 42 dated October 14, 1921.

If the appointment of the personnel of this Division as surveyors as soon as they qualify themselves is authorized, the revision and monumenting of the forest zone of Mt. Malaraya in the Provinces of Batangas and Tayabas will be started, and upon completion of this survey, as well as that of the proposed northern Masbate Forest Reserve, which was already classified and demarcated, their proclamation and registration as forest reservations will be applied for.

The special work of this office will be the compilation of all the available data regarding lands decreed as public lands by the Court of Land Registration, in ordinary and cadastral cases, in order to certify to the Director of Lands whether the land is alienable and disposable or not.

PUBLIC FOREST LANDS CASES

There have been inspected 124 land registration cases with a total area of 245,840.0995 hectares during the year 1922 as compared with 88 cases with an aggregrate area of 102,965.9930 hectares during the year 1921. Apparently, there is a marked increase in the amount of work performed, due principally to the fact that more time has been devoted by the field force to this kind of work and the greater number of cases received during the year than in any of the previous years.

The following table shows the status and number of cases received and pending during the year 1922:

	Cadastral			Ordinary			Total		
	Cases	Lots	Area in Ha.	Cases	Lots	Area in Ha.	Cases	Lots[a]	Area in Ha.
Pending in 1921	16	13,584	83,576.8364	31	59	5,574.8572	47	13,643	89,151.6936
Received in 1922	64	53,195	233,176.0997	1758	3,556	37,636.1895	1822	57,751	260,812.2892
Total number of cases handled in 1922	80	66,779	306,752.9.61	1789	3,615	43,211.0467	1869	71,394	349,963.9828
Number of cases action unnecessary	28	26,023	82,144.7752	1717	3,464	21,979.1121	1745	29,487	104,123.8873
Cases acted upon in 1922	52	40,756	224,608.1609	72	151	21,231.9346	124	40,907	254,840.0955
Cases opposition withdrawn after inspection	14	16,378	12,756.7279	41	77	4,658.5138	55	16,455	17,415.2417
Cases in Court	36	25,797	190,982.1489	28	63	14,667 3892	72	24,437	226,618.9322
Cases lost				3	11	1,787.0316	3	11	1,787.0316
Cases won[b]	2	577	20,869.2841				2	577	20,869.2841
Cases pending on January 1, 1923	36	25,797	190,982.1489	28	63	1,787.0316	72	24,437	266,618.9322

[a] It should be understood that only a part of the area in these lots is forested.

[b] In the two cases won, the area of the lots was 20,869.2841 hectares and only a portion of this area was exluded as public forest lands, one of which is being surveyed and the other still pending.

LAND CLASSIFICATION

The Bureau of Forestry has always recognized the importance of agricultural, commercial, industrial, or any other lawful development of all lands within the public forests which will make the largest return to the general prosperity. It is for this reason that this office has consistently desired and has steadfastly sought to classify as alienable and disposable all available public lands. In carrying on the land classification, it is always borne in mind that the forests are maintained and established in order that their resources may be developed and used in a way that will contribute in the greatest measure to the public good, the fundamental aim being to put to its most productive use every foot of land in the forests, as for instance, those areas most valuable for agricultural, industrial, commercial, or other lawful purposes are classified as alienable and disposable while those areas valuable for forestry purposes either because of the present stand of timber, or for the permanent production of timber, for protection of streams, or for special uses, are retained.

There have been received from the Bureau of Lands and the Municipal and Provincial Governments requests for land classification which, owing to the lack of adequate funds and personnel, had to be held pending. The land classification project still in progress in Puerto Princesa, Palawan, was only made possible thru the coöperation of the Provincial Government of Palawan which furnished the necessary funds for the project.

Unfortunately, this office has not been able to follow the policy adopted in the previous years of giving special attention to the land classification. The land classification parties already organized to locate the alienable and disposable lands have been used in the inspection of the thousands of pending individual public land applications which it has finally been decided should be inspected and certified by this Bureau to the Bureau of Lands. Consequently, a greater number of individual parcels have been certified to the Bureau of Lands, and fewer land classification projects attended to than in any year since the enactment of the new Public Land Law on November 29, 1919. It is hoped, however, as soon as the present great accumulation of public land applications is cleared up, that it will be possible to resume the former policy of giving primary consideration to land classification work.

The following tabulated statement shows the total number of land classification project acted upon by the office since its commencement in the year 1920:

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares	Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun—	Completed—				
1	Bureau of Lands....	April 12, '20	Camarines Norte.	Labo.....	May 7, '20	May 25, '20	July 3, '20	6,022	₱158.48	
2	Proclamation No. 20.	May 25, '20	Mindoro...	Bongabon.....	May 5, '20	July 3, '20	Aug. 25, '20	17,080	262.77	
3	Bureau of Lands....	May 13, '20	Nueva Ecija	Bongabon.....	July 1, '20	July 16, '20	Aug. 24, '20	7,840	152.81	
4	Bureau of Lands....	June 19, '20	Camarines Sur.	Calabanga and Tinambac.	Sept. 18, '20	Sept. 30, '20	Dec. 3, '20	33,809	511.78	
5	Proclamation No. 50.	Nov. 4, '20	Mindoro...	Calapan.....	Aug. 1, '20	Sept. 15, '20	Nov. 17, '20	28,499	457.11	
6	Bureau of Lands....	June 19, '20	Sorsogon...	Irosin.....	Nov. 11, '20	Nov. 28, '20	May 9, '21	1,616	482.39	
7	Bureau of Lands....	Aug. 31, '20	Occidental and Oriental Negros.	San Carlos, Murcia, La Castellana and Vallehermoso.	Oct. 2, '20	Dec. 15, '20	July 11, '21	33,357	1,302.69	
8	Bureau of Lands....	June 19, '20	Leyte.....	Alang-alang.....	Nov. 21, '20	Dec. 23, '20	May 24, '21	14,450	300.11	
9	Bureau of Lands....	June 19, '20	Samar.....	Gandara, Tarangnan, and Catbalogan.	Oct. 22, '20	Jan. 11, '21	Aug. 11, '21	9,820	518.54	
10	Bureau of Lands....	June 19, '20	Leyte.....	Ormoc.....	Jan. 3, '21	Jan. 15, '21	June 23, '21	19,750	514.63	
11	Proclamation No. 51.	Nov. 19, '20	Tayabas....	Guinayangan and Calauag.	Dec. 17, '20	May 19, '21	Oct. 18, '21	22,126	2,673.66	
12	Bureau of Lands....	April 30, '21	Nueva Vizcaya.	Bagabag, Solano Bayombong and Bambang.	May 26, '21	July 21, '21	Dec. 28, '21	31,740	651.03	
13	Proclamations Nos. 65 and 66.	Dec. 15, '20	Cagayan...	All, except Calayan.	April 2, '21	Sept. 13, '21	Pending certification.	512,454.00	₱9,044.46	
			Isabela, Nueva Vizcaya.	All Bagabag, Bayombong, Bambang and Solano.						
			Kalinga....	Banginuk-puk, Tabuk and Ripang.						
			Apayao....	Ripang, Tauit, Calasitan, Nagbanaggan, and Caggaddiongan.						
			Ilocos Norte	Lañgañgan.....						
14	Resolution No. 50 Municipal Council.	Oct. 12, '20	Tayabas....	Baler.....	July 8, '21	Dec. 3, '21	Nov. 25, '22	26,411.00	1,401.19	
15	Bureau of Lands....	June 19, '20	Leyte.....	Capoocan.....	Oct. 5, '20	Nov. 20, '20	May 12, '21	4,000.00	983.44	
16	Proclamation No. 40.	Oct. 9, '20	Nueva Ecija	Vaca.....	Nov. 16, '21	Nov. 27, '21	Oct. 24, '22	11,215.51	95.15	
17	Bureau of Lands....	June 19, '20	Occidental Negros	Kabankalan.....	July 29, '21	Nov. 27, '21	Oct. 14, '22	27,817.00	1,485.85	
18	Bureau of Lands....	Jan. 24, '22	Nueva Ecija	Muñoz.....	Jan. 26, '22	Feb. 3, '22	Mar. 8, '22	246.00	50.85	
19	Proclamation No. 67.	Dec. 15, '20	Bukidnon..	Malaybalay.....	.....	.....	Jan. 12, '23	2,488.40	.....	
20	Proclamation No. 51.	Nov. 19, '20	Tayabas....	Guinayangan.....	May 4, '22	May 31, '22	Pending certification.	26,314.72	640.70	

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares	Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun—	Completed—				
21	Director of Forestry.	Feb. 20, '20	Masbate...	Aroroy, Masbate, and Milagros.	Feb. 28, '22	July 15, '22	Pending certification.	[a] 33,098.98	₱4,489.96	Taken in connection with the survey of the Northern Masbate Forest Zone
22	Proclamation No. 67.	Dec. 15, '20	Agusan.....	Butuan and Cabadbaran.	Aug. 28, '22	Sept. 24, '22	Dec. 28, '22	42,265.80	702.05	
23	Director of Forestry.	Aug. 1, '22	Pampanga..	Arayat.....	Aug. 17, '22	Nov. 30, '22	Pending certification.	[a] 764.00	215.40	Taken in connection with the survey of Mt. Arayat Forest Reserve.
24	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Maganoy.....	Oct. 20, '22	Oct. 20, '22	Jan. 17, '23	2,675.96	13.81	Agricultural Colony No. 4.
25	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Pikit-Pagalongan....	Oct. 23, '22	Oct. 23, '22	Jan. 17, '23	4,475.15	13.81	Agricultural Colony No. 5.
26	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Silik.....	Oct. 24, '22	Oct. 25, '22	Jan. 17, '23	1,719.43	27.61	Cotabato Agricultural Colony No. 7.
27	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Glan.....	Oct. 27, '22	Nov. 5, '22	Jan. 17, '23	1,887.60	138.07	Agricultural Colony No. 9 including agricultural land outside of Cad.
28	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Silik.....	Oct. 21, '22	Oct. 22, '22	Jan. 17, '23	523.84	27.61	Agricultural Colony No. 2 Paide-Pulanngi.
29	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Silik.....	Oct. 27, '22	Oct. 28, '22	Jan. 17, '23	1,277.02	27.61	Agricultural Colony No. 15, Barrio Langayon.
30	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Cotabato.....	Sept. 7, '22	Sept. 8, '22	Pending.....	1,363.01	27.61	Taboan Cad. No. 130.
31	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Tuguis.....	Oct. 11, '22	Oct. 24, '22	Pending.....	4,272.43	193.29	Tuguis Cad. No. 152 and agricultural land outside.

32	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Dulauan and Cotabato.	Oct. 29, '22	Nov. 19, '22	Pending.....	[a] 29,463.75	303.76	Northern part of B. L. Cad. No. 107 from Saronayan to Pinarino including agricultural land outside of cadastre.
33	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Cotabato Awang and Lebak.	Sept. 6, '22	Sept. 27, '22	Pending.....	[a] 15,040.80	276.14	From Awang Agricultural School to Lebak excluding Tabuan Cadastral No. 130.
34	Proclamation No. 67.	Dec. 15, '20	Cotabato...	Awang.....	Oct. 4, '22	Oct. 9, '22	Pending.....	[a] 2,734.80	82.84	Kiblig-Upi-Bo rongotan Valley.
35	Director of Forestry..	May 26, '22	Nueva Ecija	Carranglan, Lupao, and San Jose.	June 7, '22	June 26, '22	Pending certification.	2,154.00	187.91	
36	Director of Forestry.	May 26, '22	Nueva Ecija	Carranglan and Pantabangan.	June 26, '22	Aug. 1, '22	Pending certification.	41,393.00	343.56	
37	Proclamation No. 67.	Dec. 15, '20	Lanao.....	Momungan, Iligan, Kolambugan, and Kapatagan.	Aug. 30, '22	Dec. 16, '22	Report in progress.	[a] 47,081.25	843.42	
38	Director of Forestry.	Aug. 21, '22	Misamis....	Misamis.....	Nov. 24, '22	Dec. 10, '22	Report in progress.	[a] 7,200.00	76.00	

[a] This area is calculated, the corresponding land classification report being under preparation.

The following is a tabulated statement of land classification projects pending on December 31, 1922:

Requested		Regions		Field work	
By—	Date	Provinces	Municipalities	Begun—	Completed—
Proclamation No. 67	Dec. 15, '20	Agusan	All [a]		
		Bukidnon	do		
		Cotabato	do		
		Davao	do		
		Lanao	do		
		Zamboanga			
Resolution No. 6, Municipal Council	Feb. 28, '22	Tayabas	Quezon		
Director of Lands	Sept. 20, '22	Negros Oriental	Ayuquitan		
Lieutenant Governor of Catanduanes	Oct. 20, '22	Albay	Catanduanes		
Resolution No. 91, Municipal Council	Oct. 31, '22	Tayabas	Polillo		
Resolution No. 67, Municipal Council	Oct. 31, '22	Tayabas	Gumaca		
		Nueva Ecija	All		
Director of Lands	Nov. 14 '22	Pangasinan	Balungao, Natividad, San Quintin, Tayug, Umingan	In progress.	
Resolution No. 121, Provincial Board	Nov. 18, '22	Palawan	Puerto Princesa	In progress.	
Resolution No. 46, Municipal Council	Dec. 1, '22	Tayabas	San Narciso		

[a] Except land classification already made in: Butuan and Cabadbaran, Province of Agusan; Awang, Borongotan, Cotabato, Glan, Kiamba, Kling, Lebak, Maganoy, Paido-Pulangi, Pikit-Pagalungan, Sarunayan, Silik, Talitay and Tuguis, Province of Cotabato; and Iligan, Kolambugan, and Momungan, Province of Lanao.

The following is a summary of the preceding table showing, by fiscal years, the total area classified as alienable and disposable and the corresponding expenses incurred, excluding salaries:

Year ended December 31—	Area in hectares	Expenses excluding salaries
1920	146,673.00	₱4,611.58
1921	661,333.51	16,384.51
1922	[a] 268,438.96	7,753.61
Grand total	1,076,445.47	28,749.70

[a] 123,367.40 hectares of this total area were calculated, the corresponding land classification report being under preparation.

The table in the appendix shows the distribution of individual public land applications in the different provinces of the Archipelago, the summary of which is as follows:

Applications pending from previous years		4,932	
Applications received during 1922		12,791	
			17,723
Certified for agriculture	2,795		
Certified for forestry	553		
Returned uncertified	182		
			3,530
Total pending December 31, 1922			14,193

PRIVATE FOREST LANDS REGISTRY

Twenty-eight certificates of forest registration covering 44 parcels of land with a total area of 3,493 hectares, 81 ares, and 54.03 centares, have been issued during the year in accordance with section 1829 of the Revised Administrative Code, of which 580 hectares, 57 ares, and 54 centares are highland forests; 419 hectares, 9 ares, and 47 centares mangrove swamps; and 2,494 hectares, 14 ares, and 54.03 centares cultivated and open land. Aside from these, there were 9 provisional certificates of forest registration issued during the year, covering 9 parcels of land with a total area of 5,317 hectares, 17 ares, and 38 centares.

The total area covered by provisional and proper certificates of forest registration issued in 1922, is 2,741 hectares, 49 ares, and 95.03 centares less than in the preceding year.

The greater part of the work in this section during the year consisted in preparing correspondence on claims to public forest lands, the majority of which are based on mere assertions and occupancy together with tax receipts, with a view to examine their legality for inscription in the Bureau of Forestry. A considerable number of such claims to forest lands have not been registered due to failure on the part of the claimants to present proper title in accordance with the law. Most of the applications for registration acted upon during the year are for small parcels, generally covered with mangrove swamps, as compared with those of the previous years covering in most cases big parcels of highland forests. In looking over the records it has been found that about 136 letters of requests to submit evidence of title are still pending answer from the

claimants. Some of these letters are dated back in 1918. These are the main causes for the decrease during the year in the number of certificates issued, number of parcels and area of the land covered under registration.

The following table shows the private woodlands registered up to December 31, 1922:

Registered private woodlands

Calendar year	Number of—			
	Parcels	Hectares	Ares	Centares
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,215	86	62
1910	4	8,653	85	22
1911	5	5,533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
1917	48	7,985	68	39
1918	84	43,213	17	26
1919	110	14,943	71	39
1920	41	47,723	82	90
1921	53	11,552	48	87
1922	44	3,493	81	54
Total	1,238	443,520	97	29

FOREST RECONNAISSANCE

The Division has not been actively engaged in any extensive reconnaissance, though the following minor reconnaissances were undertaken during the year:

1. Culion, Palawan.
2. Nipa swamps in Butuan, Agusan.
3. Nipa swamps in Abulug and Pamplona, Cagayan.
4. Rosa and Malunao Islands, Palawan.

The last three reconnaissances are still in progress.

FOREST RESERVES AND ZONES

The Busol Forest Reservation.—This tract of land situated in the township of La Trindad, City of Baguio, Mountain Province, having an area of 336 hectares, 58 ares, and 54 centares, was set aside as a forest reservation on April 27, 1922, by

Proclamation No. 15, for the purpose of conserving and protecting water and timber supply, the protection of the water supply being of primary importance, and all other uses of the forest are to be subordinated to that purpose.

The Cave Forest Reservation.—This tract of land situated in the City of Baguio, Mountain Province and containing 4 hectares, 7 ares, and 28 centares was set aside as a forest reservation by Proclamation No. 16, for the purpose of protecting and developing the scenic beauties of the reservation.

Mt. Arayat Forest Reserve.—This reservation was proclaimed on October 14, 1921 and included in 1921 annual report. The map as prepared was based on rough surveys. So in the latter part of 1922, a forest surveyor of this Bureau, duly authorized by the Department Secretary resurveyed and monumented this tract. The plan and proper technical description are now under preparation.

Proposed Forest Reserve for the Manila Railroad Company along the Calauag-Aloneros Railroad Line.—This was initiated by the Manila Railroad Company authorities. The purpose is to protect and conserve the forest in the area along the Calauag-Aloneros railroad line as a park and for its scenic beauty. This tract was certified before as alienable and disposable land to the Bureau of Lands. Hence, approved homesteads with the corresponding improvements are at present found in the area. The Manila Railroad Company has agreed to pay for the improvements made in the homesteads, and pending settlement of this, the proclamation for the reservation is held in abeyance.

Proposed Northern Masbate Forest Reserve.—This tract of land comprises the municipalities of Aroroy, Masbate, and Milagros—the mining district. The purpose is two-fold: for the protection of the forest from unnecessary destruction so as to provide for a constant timber supply for developing the mining industry and protecting the watersheds. The area of the proposed forest reserve is 40,270 hectares. The total area mapped is 70,368 hectares of which 30,098 hectares may be considered as alienable and disposable land.

The following is a complete list of all the forest reserves proclaimed or proposed up to December 31, 1922:

Title	Provinces	Date of proclamation
Lanao Forest Reservation [a]	Bataan	Executive Order No. 33, July 26, 1904.
Atimonan Forest Park	Tayabas	Proclamation No. 2, January 28, 1913.
Salinas Forest Reservation	Nueva Ecija	Executive Order No. 44, May 18, 1914.
Forbes Forest Park	Benguet	Philippine Commission Resolution No. 119, October 12, 1915.
Limay Forest Station Site	Bataan	Executive Order No. 34, April 11, 1917.
Forest Reservation on Coal bearing district, Polillo Island	Tayabas	Proclamation No. 31, July 31, 1917.
Forest Reservation on Coal bearing districts, Alabat Island	Tayabas	Proclamation No. 31, July 31 1917.
Teak Reservation	Sulu	Proclamation No. 42, October 31, 1918.
Kolambugan Forest Station Site	Lanao	Executive Order No. 85, December 3, 1919.
The Makiling National Botanic Garden [b]	Laguna	Proclamation No. 60, November 30, 1920.
Western Batan Island Forest Reserve	Albay	Proclamation No. 22, August 6, 1921.
Mt. Banahao and San Cristobal Forest Reserve	Laguna and Tayabas	Proclamation No. 42, October 14, 1921.
Mt. Arayat Forest Reserve	Pampanga	Proclamation No. 42, October 14, 1921.
Busol Forest Reserve	Benguet	Proclamation No. 15, April 27, 1922.
The Cave Forest Reserve	Benguet	Proclamation No. 16, April 27, 1922.
Talisay-Minglanilla Forest Reserve [c]	Cebu	.....
Northern Negros Forest Reserve [c]	Occidental Negros	.....
Talavera Watershed Forest Reserve [c]	Nueva Ecija	.....
Forest Reserve for the Manila Railroad Company along the Calauag-Aloneros railroad line [c]	Tayabas	.....
Pagsanhan Gorge National Park [c]	Laguna	.....

[a] Amended by Proclamation No. 8, July 12, 1919, excluding certain agricultural portion of the reserve for public use.

[b] Formerly designated as Makiling Forest Reserve under Proclamation No. 106, series of 1910.

[c] Preliminary examination and survey already finished, to be recommended for proclamation.

Forest Zones.—In connection with the land classification projects mentioned elsewhere in this report, forest zones were established in the regions classified in order to separate the lands that are retained by the Bureau of Forestry for forest purposes. The following tabulated statement shows the forest zones thus established and certified to the Director of Lands since 1920 up to December 31, 1922:

Land classification project No.	Provinces	Municipalities	Area in hectares	Date certified to Director of Lands
4	Camarines Sur	Calabanga and Tinambac	3,016.00	December 3, 1920.
5	Mindoro	Calapan	7,374.00	December 17, 1920
6	Sorsogon	Irosin	3,490.00	May 9, 1921.
8	Leyte	Alang-alang	491,68	May 4, 1921.
9	Samar	Gandara	3,020.00	August 11, 1921.
11	Tayabas	Calauag and Guinayangan	1,287.00 [a]	October 18, 1921.
12	Nueva Vizcaya	Bagabag, Solano, Bayombong and Bambang	3,452.80	December 28, 1921
14	Tayabas	Baler	1,331.00	November 25, 1922
17	Occidental Negros	Kabankalan	1,450.31	December 14, 1922

[a] This area will be certified as alienable and disposable as soon as the commercial timber trees found on the land are utilized in accordance with the Forest Law and Regulations.

The following is a summary of the preceding tabulated statement by fiscal year, showing the total area of the forest zone established in connection with land classification projects and certified to the Director of Lands:

Fiscal year	Area in hectares
1920	10,390.00
1921	11,741.48
1922	2,781.31
Total	24,912.79

COMMUNAL FORESTS

There have been established 214 new parcels of communal forests with a total area of 21,245.00 hectares as compared with 95 parcels with a total area of 10,322.20 hectares for 1921. The numerous requests from several municipalities for the establishment of additional parcels of communal forests have largely been responsible for this increased number during the year.

Due to the increasing number of conflicts which occur from time to time regarding cases of illegal destruction and occupation of lands within the communal forests and the lack of coöperation in their protection and conservation on the part of the majority of the municipal authorities, this Bureau endeavored to arouse the interest of the municipal officials with a view to secure their coöperation in the proper supervision and administration of the communal forests. These efforts met with a slightly better success this year than in the previous years. Municipal ordinances providing for the purpose just stated have been passed by some municipal councils and have received the approval of this office.

The following table shows the total number of communal forests established up to December 31, 1922, and their distribution by provinces:

Statement of communal forests established up to December 31, 1922

Provinces	Parcels established		Total parcels established up to 1922	Municipalities, rancherias or townships			Cancelled	
	Before 1922	During 1922		With C. F.	Without C. F.	Area in hectares of parcels established up to 1922	Parcels	Hectares
Abra	29	3	32	18	21	6,110.00	1	316.00
Albay–Catanduanes	23	15	38	16	7	3,083.00	5	574.00
Antique	5	1	6	6	7	1,406.00	.....	.....
Bataan	16	1	17	12	0	5,141.40	2	464.00
Batanes	.....	.....	.....	.....	6	.....	.....	.....
Batangas	2	0	2	1	24	136.00	.....	.....
Bohol	38	3	41	27	9	5,384.80	.....	.....
Bulacan	2	1	3	3	21	500.16	1	232.16
Cagayan [a]	39	8	47	21	4	5,910.60	5	590.00
Camarines Norte	8	0	8	7	2	1,171.00	.....	.....
Camarines Sur	43	3	46	28	3	5,274.90	1	175.00
Capiz	32	1	33	15	10	3,062.00	1	88.00
Cavite	1	0	1	1	19	252.00	.....	.....
Cebu	12	14	26	16	35	2,027.80	.....	.....
Ilocos Norte	22	4	26	16	14	9,722.00	5	1,612.00
Ilocos Sur	27	12	39	29	29	7,160.00	3	3,160.00
Iloilo	14	3	17	10	25	2,029.00	.....	.....
Isabela	19	1	20	14	13	3,351.00	1	106.00
Laguna	16	0	16	11	17	2,252.00	.....	.....
La Union	16	5	21	20	13	5,649.00	1	240.00
Leyte	51	26	77	32	14	6,970.28	.....	.....
Mindoro	11	10	21	8	11	2,259.00	.....	.....
Misamis	21	2	23	13	42	3,450.00	.....	.....
Mindanao and Sulu:								
Agusan	1	5	6	4	54	946.00	.....	.....
Bukidnon	1	0	1	1	11	620.00	.....	.....
Cotabato	.....	.....	.....	.....	32	.....	.....	.....
Davao	2	8	10	3	20	1,227.00	.....	.....
Lanao	3	0	3	2	36	1,053.00	2	800.00
Sulu	.....	.....	.....	.....	29	.....	.....	.....
Zamboanga	4	1	5	3	75	400.00	1	9.00
Mountain Province:								
Apayao	4	0	4	1	6	606.00	.....	.....
Benguet	1	4	5	2	10	248.00	.....	.....
Bontoc	0	1	1	1	17	180.00	.....	.....
Ifugao	0	2	2	1	5	556.00	.....	.....
Kalinga	.....	.....	.....	.....	13	.....	.....	.....
Nueva Ecija	29	1	30	23	35	6,580.00	2	393.00
Nueva Vizcaya	10	7	17	6	12	2,757.00	.....	.....
Occidental Negros	32	0	32	14	11	3,633.00	1	240.00
Oriental Negros	16	5	21	15	83	2,019.00	1	76.00
Palawan	.....	.....	.....	.....	16	.....	.....	.....
Pampanga	3	0	3	3	18	395.00	.....	.....
Pangasinan	49	5	54	32	32	14,680.48	3	725.00
Rizal	14	2	16	9	18	1,639.40	1	76.00
Romblon	6	4	10	7	2	1,110.00	1	60.00
Samar	59	4	63	34	11	9,073.00	.....	.....
Sorsogon–Masbate	29	20	49	20	4	3,735.00	.....	.....
Surigao	15	11	26	11	20	3,533.00	2	182.00
Tarlac	11	0	11	8	8	1,894.00	1	265.00
Tayabas	45	17	62	21	7	5,750.00	2	366.00
Marinduque	10	2	12	4	2	1,572.00	.....	.....
Zambales	20	2	22	13	0	4,513.00	.....	.....
Total	811	214	1,025	562	933	151,021.82	43	10,739.16

[a] Due to public calamity, the communal forests of Abulug, Ballesteros, Claveria, Pamplona and Sanchez Mira, Province of Cagayan, were suspended temporarily to June 30, 1923, to allow the residents thereof to enjoy, during that period, the privileges granted by section 1840 of the Revised Administrative Code as amended by Act No. 2902.

	Parcels	Hectares
Total number of parcels and hectares established from 1908 to 1922	1,025	151,021.82
Total number of parcels and hectares cancelled in various years	43	10,739.16
Balance in force	982	140,282.66

Communal forests established from 1908 to 1922

Year	Parcels	Hectares
1908	19	5,326.00
1909	19	6,609.00
1910	19	5,796.00
1911	53	15,147.60
1912	59	10,957.00
1913	26	3,387.00
1914	45	6,860.00
1915	90	12,129.00
1916	110	15,862.00
1917	83	10,110.00
1918	61	7,704.82
1919	63	10,537.35
1920	69	9,008.85
1921	95	10,322.20
1922	214	21,245.00
Total	1,025	151,021.82

MAPPING AND DRAFTING

Fewer trail notes were taken during the year 1922 than in the previous year, due to the fact that the nature of the work during the year was such that it did not require much surveying as practically all the areas covered by the field trips of the Forest Officers have been mapped in the previous years.

Number of kilometers of field notes and number of hectares of valuation surveys taken during 1922

District No.—	Received		Pending		Total	
	Kilometers	*Hectares*	*Kilometers*	*Hectares*	*Kilometers*	*Hectares*
1	433.58	4.50	460.28	1.00	893 86	5.50
2	141.75	5.00	51.48	.....	193.23	5.00
3	110.94	4.00	208.46	.....	319.40	4.00
4	484.02	24.10	1,004.43	11.48	1,488.45	35.58
5	1,444.43	71.06	77.95	9.80	1,522.38	80.86
6	682.18	40.11	107.80	36.64	789.98	76.75
7	69.08	8.10	87 85	6.50	156 93	14.60
8	478.73	51.27	980.59	82.50	1,459.32	133.77
9	96.33	13.21	85.72	.....	182.05	13.21
10	334 52	36.93	83.44	10.06	417.96	46.99
11	160.42	11.16	181.65	.....	342.07	11.16
12	41.63	5.00	62.14	2.00	103.77	7.00
13	892.82	90.82	571.65	31.50	1,464.47	122.32
Total	5,370.43	365.26	3,963.44	191.48	9,333.87	556.74

Comparative statement of field notes and forest valuation surveys taken in 1921 and 1922

Year	Total number of kilometers of field notes	Total number of hectares of forest valuation surveys
1921	13,087.95	1,137.74
1922	9,333.87	556.74

The following figures show that there has been accomplished during the year a greater volume of work than in previous years in the compilation of topographical and forest data taken in connection with various projects, particularly land classification, communal forest and preparation of maps to accompany the reports of Forest Officers in the opposition of the Bureau of Forestry in public forest land cases:

Progressive forest maps:	Sheet
Scale 1:100,000—1° × 30′ = 45″ × 25″	[a] 162
On drawing paper:	
Pending preparation on December 31, 1921	29
Prepared during 1922	9
Pending preparation on December 31, 1922	20
On tracing cloth:	
Pending on December 31, 1921	110
Prepared during 1922	13
Pending preparation on December 31, 1922	97
Scale 1:20,000—10′ × 10′ = 38″ × 38″	[a] 1,481
On drawing paper:	
Pending preparation on December 31, 1921	1,359
Prepared during 1922	1
Pending preparation on December 31, 1922	1,358
On tracing cloth:	
Pending preparation on December 31, 1921	1,451
Prepared during 1922	19
Pending preparation on December 31, 1922	1,432
Special maps:	
Communal forest:	
Pending on December 31, 1921	12
Received during 1922	118
Total	130
Completed during 1922	121
Pending on December 31, 1922	9
Land classification:	
Pending on December 31, 1921	2
Received during 1922	8
Total	10
Completed during 1922	7
Pending on December 31, 1922	3

[a] 973.372 kilometers of trail notes were compiled on two sheets, scale 1:20,000, and on five sheets, scale 1:100,000, of the progressive forest maps.

Special maps—Continued.	Sheet
Others completed during 1922:	
Forest reserves {Baguio Forbes Park 1; Pagsanhan Gorge National Park 1}	2
Forest reconnaissance (Culion Leper Colony)	1
Forest contract of leases or special permits	2
For opposition against the registration in the court	90
Showing vegetation in color	10
Copies in blue and maduro prints for field force and official uses (164 in maduro)	3,697
Sold to different entities (₱165.62)	116
Miscellaneous	171

ADMINISTRATIVE DIVISION

GENERAL STATEMENT

The work of this division involves the general supervision of all the clerical work of the Bureau, the keeping of the efficiency and civil service records of the employees and all general records, the preparation of estimates for the annual appropriation and distribution of same and its accounting, the care of the property, the control of the clerks in the provinces, the upkeep and maintenance of the office building, the supervision of the general section and the general administration of the office, including the preparation of some letters and typewriting of some reports appertaining to other divisions and all those appertaining to its own. This Division is also in charge of all correspondence received in this office for distribution to different divisions of this Bureau and the checking of such letters, reports, etc., prepared by other divisions before they are sent out.

While this Bureau is technical, this Division, therefore, is directly affected by any increase in the technical, or quasi-technical personnel or in the activities of this Bureau, but due to the economy measure which has been strictly adhered to in this office, the personnel in the various sections under this division has been over-worked due to the fact that it has not been increased proportionately; hence, the undersigned wishes to request in this connection that due recognition be accorded the clerical personnel of this Bureau in general.

The present salaries paid to the clerks in this Bureau do not hold much incentive on account of the fact that they are disproportionate to the work required of them and the responsibilities

they have to assume. As stated, this is a technical Bureau, hence a clerk must remain some time in this office before he can be of greatest use to this Bureau, but in view of the low salaries allowed them and the lack of any margin for an increase in salary, the result has been a constant change in this class of personnel. The majority of clerks in this Bureau who have remained a number of years in the service are at the present time still drawing very little over the entrance salaries of their grades.

In the first part of this year, upon the approval of the Appropriation Act (No. 2997), this office was informed that no new appointments or filling of vacancies were to be made. In compliance with this order, a number of district clerical positions in the provinces were not filled in spite of the fact that the Appropriation Act provided for them. The result of this was most unpleasant as the rangers in the district offices in which these clerks were to have been assigned had to perform clerical work to the detriment of their technical work, preventing them, in various instances, from going on field trips as by doing so they had to close their stations for there would be no one to be left in them. In some cases, however, in order to remedy this situation, rangers and forest guards had to be asked to perform clerical work but this, in view of their lack of training and because their time was needed in their regular work, did not give good results and should not be allowed to continue.

As the restriction as to appointments and filling of positions was not withdrawn from this Bureau and the Legislature having cut all vacant clerical positions, which were held vacant on account of the restriction, though most urgently needed, except two, the undersigned wishes to state that he cannot see how the clerks in the Central Office as well as in forest district offices of this Bureau can cope properly with the increased work which falls upon them by the addition of technical personnel and activities in this Bureau. It is hoped, however, that they will not fall behind in their work, but if they do, the undersigend will consider it a matter beyond their control and due to the prevailing conditions.

The undersigned, therefore, wishes to recommend earnestly that additional clerks be allowed this Bureau and that the salaries paid present clerks be raised to correspond with their duties and responsibilities. Likewise, the number of messengers should be increased from three to six.

The Administrative Division of this Bureau has under its control, the following sections, besides having direct supervision over all clerical work of the Bureau:

Accounting, Property, Records, Library and Translating, General Service Sections, and District Clerks.

ACCOUNTING SECTION

This section is in charge of the auditing of all expense accounts of the personnel and all such accounts as are rendered by or against this Bureau as well as the preparation of all warrants in payment of salaries and all accounts of its employees and other parties and the entry in the books of all financial transactions of this Bureau. The average accounts audited and classified in accordance with the instructions of the Insular Auditor in this section runs to more or less 600 monthly. In addition to such periodical financial reports as have to be prepared for the Insular Auditor and the Department Secretary in regard to the status of the funds of this Bureau, there are also prepared warrants and journal vouchers ranging from 1,000 to 1,200 monthly.

During the last three years, the personnel of this section has not been increased although the work has been augmented due to the employment of additional rangers and forest guards who naturally incur expenses, accounts for which have to be audited and reimbursed through this section. This Bureau also acts as a paying agent for the Forest School pensionados whose funds are kept in the University of the Philippines and this work is also handled by this section.

As this Bureau is under contract to appoint the graduate pensionados of the Forest School, the senior class of this School which will graduate next March will have to be appointed and consequently it will again increase the volume of work which is being handled in this section while no additional help has been accorded.

As soon as circumstances permit, it is, therefore, earnestly requested that at least an additional clerk be added to this section in order to expedite to a certain extent the work in it.

PROPERTY SECTION

This section was transacting its work as usual until July, 1922, when the property records of supplies were altered according to the ruling of the Insular Auditor to the effect that

General Form No. 45-a (issue voucher) be used. This requirement has involved a considerable amount of additional work in this section.

During the year, there were received in this section 335 requisitions for expendable supplies, excluding requisitions for equipment and postage stamps, from field men alone. These requisitions were promptly filled with such supplies as were available in the storeroom of this Bureau. On account of the fact that since the beginning of the year 1922, requisitions sent to the Department Secretary were generally cut to one-half of the original amount requested, on account of the ruling that no stock for more than three months' use should be kept, considerable difficulty has been encountered in keeping the district offices, which are often located in places difficult of access, supplied with the necessary materials. These difficulties, however, in spite of the inadequate personnel in this section, are about to be remedied.

The funds appropriated in accordance with the Appropriation Act for 1922 for supplies and materials were exhausted in the latter part of the year and so this office immediately requested from the Emergency Board an additional amount but this was granted too late to be of great help.

According to the ruling of the Emergency Board, all requisitions for equipment have to be acted upon by that Board. During the year a number of requisitions for equipment were disapproved for the reason that their acquisition could be delayed until the income of the Government is increased. This office, on account of this fact, has to require the rangers to go on without such necessary equipment, informing them however, that they would be secured as soon as circumstances permit. During the year, non-expendable supplies amounting to ₱2,193.54 were obtained from the Bureau of Supply and equipment valued at ₱10,482 consisting of office furniture, which in some cases had to undergo repairs before they could be used were transferred from other Bureaus. Equipment of this Bureau which was absolutely unserviceable, which had an original value of ₱1,400, has been dropped from the property accountability of this Bureau by the Insular Auditor.

COLLECTIONS

The amount of deposits during the year 1922, as bonds of forestry licensees, amounted to ₱102,975 as against ₱86,000

collected during the year 1921. During the year 1923, it is expected that collections will be greater on account of the fact that rentals derived from pastures, fishponds, and swamps, previously collected by the Bureau of Internal Revenue are at present being collected in this office, in accordance with the recent authority granted to this office.

This section, as well as the other sections under this division, has also an inadequatte personnel and it is requested that as soon as circumstances permit, additional help be given.

RECORDS SECTION

This section is in charge of all the general records of this Bureau, including distribution of publications, the preparation of personnel lists and applications for leave. All mimeograph work of this Bureau is also handled in this section.

At the beginning of the year, some changes in the personnel of this section took place and an experienced clerk in this Bureau was made its chief. During the year, certain changes in the handling of the work have been inaugurated which have very much improved the service in this section.

The filling system used is similar to that adopted by the United States Forest Service whereby correspondence received and sent by this Bureau is designated in accordance with the subject matter. Briefing correspondence on cards, which has been introduced since the middle part of the year, has proved very helpful in the sense that it makes it easier to locate correspondence already recorded as they serve as indices to the correspondence on file.

Mail sent by this Office:	
Registered letters and packages	3,140
Letters sent by ordinary mail including packages, licenses, circulars, forms, and other printed matters	73,563
Telegrams sent by this Bureau	511
Letters delivered by messengers to different Government offices and other parties	11,106
Total	88,320
Received in this Office:	
Registered letters	3,559
Registered packages	62
Letters received by ordinary mail	26,582
Reports, working programs, expense accounts, bills, etc	31,224
Printed matter received by ordinary mail	1,248
Total	62,675

MESSENGER SERVICE

This Bureau is only allowed three messengers for the entire service and they are distributed as follows:

One for the general service in the office and two alternately to deliver correspondence from this Bureau to different Bureaus and offices of the Government and outside parties. During the year, these two messengers delivered 11,106 messages. They also get the mail from and deliver telegrams to the Post Office.

LIBRARY AND TRANSLATING SECTION

There are received in this section, from foreign countries and from various Government Bureaus, not less than fifty publications monthly which are sent to the various Division Chiefs. The different articles which are of interest to this Bureau are then catalogued and then the publications are filed in the Library.

The library is used not only by the staff of the Bureau and other Government officials but is also open to the use of students and lumbermen. The fact that last year over 200 students came to the Bureau for information on forestry matters is an indication that questions relating to forestry are arousing interest in the public schools.

Such articles in the local and foreign press as refer directly or indirectly to the activities of the Bureau of Forestry or its personnel, are clipped and conserved in a scrap book.

This section is also in charge of all translating work in the Bureau.

The actual number of books, pamphlets, and periodicals existing in the Library of this Bureau are as follows:

Number of bound volumes	562
Number of unbound volumes	70
Number of pamphlets	2,470
Current subscription to periodicals	19

RECOMMENDATIONS

The same recommendations as made in the last Annual Report are hereby reiterated, as follows:

That the policy of permanent forest reserves be given greater impetus;

That the legislation affecting communal forests be changed to give them the status of forest reserves;

That forest legislation now in force be made clearer and delegating authority of enforcement on the Director of Forestry;

That at least six forest experiment stations be established throughout the Islands;

That a forest product laboratory be provided for the Division of Investigation;

That funds be made available for adequate reforestation of watersheds;

That the Government urge the necessity of higher technical training in forestry and a more adequate teaching staff with equipment at the Forest School to the Board of Regents of the University;

That the salaries of the personnel of the Bureau be on the same plane as other technical bureaus;

That the personnel, particularly in the ranger group, be increased to adequately handle the work; and

That a permanent corps of forest guards on at least third grade Civil Service rating be allowed.

In view of the fact of the returning pensionados and in order to prepare them for their work in the Bureau, quite a problem has been presented due to the lack of experienced trained technical men with the proper technical degrees, and as has already been discussed with the Governor-General and the Secretary of Agriculture and Natural Resources, it is recommended that the Division of Forest Management as now constituted is not carrying on the functions originally intended because of the above reasons and as practically the entire work of this Division has been absorbed in license administration, it is absolutely essential that a Division of Licenses be created this coming year in order to give the entire attention of one Division of this most important work, as the proposed Division of Licenses and Division of Saw Mills and Utilization will be the two divisions upon which will devolve the collections of forest revenues and as this work is so heavy and rather involved, the proposed Division of Licenses must confine its efforts to this one phase, while the present Division of Forest Management will confine itself to technical forestry and will be built up from the Filipino pensionados returning from the United States. In other words, the Division of Forest Management will be developed into the *liaison* division whereby the technical men will be available for the introduction into other divisions of the Bureau of Forestry principles which are at times lost sight of ~~the~~ due to the heavy routine administrative work. It is planned that this Division will be created administratively within the Bureau this coming year, as it is the only way by which the work can be managed so as not to

lose sight of the training of the men returning from the United States and the practical application of their knowledge.

The demand for cigar box material, calantas and marango, has been unusually heavy during the last quarter and shows no sign of decreasing. In order to protect the export trade in cigars and supply the demand for cigar box shooks at a price which can be met by the cigar trade, it is essential that there be a coöperation between the producers of calantas and those in the cigar industry and that the exportation of calantas in other than cigar box form be restricted.

Respectfully submitted.



Director of Forestry

The SECRETARY OF AGRICULTURE
AND NATURAL RESOURCES
Manila

DIRECTORY OF THE BUREAU OF FORESTRY

ARTHUR F. FISCHER, *Director*

DIVISION OF FOREST MANAGEMENT[1]

Ramon J. Alvares	Forester, acting chief.
Antonio P. Racelis	Forester.
Felix Franco	Forester.
Nazario Peñas[2]	Forest supervisor.
Porfirio San Buenaventura	Forest supervisor.
Apolinario Suyat	Forest supervisor.
Petronilo Cortez	Ranger.
Gregorio Elumir	Ranger.
Amado B. Parreño	Forest guard.
Mariano Cenabre	Forest guard.
Jose Angeles	Junior stenographer.

SPECIAL PERMIT SECTION

Eladio C. Leaño	Forest supervisor, chief.
Porcopio L. Solidum	Forest guard.
Fausto Pe Benito	Clerk.
Benigno Ongcoy	Clerk.

LICENSE SECTION

Eufemio Santillan	Chief.
Enrique Baña	Clerk.
Luis S. Mabagos	Clerk.
Avelino Rivera	Clerk.
Francisco de Asis	Clerk.
Melanio Espiritu	Clerk.
Claro L. Camba	Clerk.
Laureano de la Peña	Clerk.
Eduardo Rosete	Clerk.
Gregorio C. Tayco	Clerk.

DISTRICT No. 1

[Provinces: Cagayan, Isabela, Mountain Province, (Apayao and Kalinga, Subprovinces of), and Batanes]

Forest Station at Aparri, Cagayan (district headquarters):

Pastor de la Peña	Officer in charge.
Angel Salazar	Ranger.
Antonio Aloba	Forest guard.
Felipe Pattugalan	Clerk.

Forest Station at Ilagan, Isabela:

Mamerto C. Azurin	Officer in charge.

[1] All scalers under this Division also belong to Division of Sawmills and Utilization.
[2] Pensionado in the United States.

Forest Station at Alcala, Cagayan:
- Deogracias Guzman — Officer in charge.
- Francisco Siriban — Ranger.

Forest Station at Echague, Isabela:
- Vicente Velasco — Officer in charge.

Forest Station at Claveria, Cagayan:
- Luis Aguilar — Officer in charge.
- Marcelo Fonacier — Forest guard.

DISTRICT No. 2

[Provinces: Ilocos Norte, Ilocos Sur, and Abra]

Forest Station at Vigan, Ilocos Sur (district headquarters):
- Espiritu Paraiso — Officer in charge.
- Eulogio Dres — Ranger.
- Gregorio F. Navarro — Forest guard.

Forest Station at Bangued, Abra:
- Cayetano Barros — Officer in charge.
- Juan Balbuena — Forest guard.

DISTRICT No. 3

[Provinces: Mountain Province (Benguet, Bontoc, Amburayan, and Lepanto), and La Union (northern part)]

Forest Station at Baguio, Mountain Province (district headquarters):
- Mauricio J. Oteyza — District forester.
- Sixto Laraya — Assistant district forester.
- Maximo Oro — Ranger.
- Vicente J. Defensor — Ranger.
- Edilberto Madrid — Ranger.
- Pedro Valentin — Ranger.
- Pastor Gracia — Forest guard.
- Godofredo Costales — Forest guard.
- Esteban Fontanilla — Forest guard.
- Francisco Abubo — Forest guard.
- Pedro Gacad — Forest guard.
- Aquilino Balbin — Forest guard.
- Timoteo Lagasca — Forest guard.
- Simon Briones — Forest guard.
- Mariano Fontanos — Forest guard.

DISTRICT No. 4

[Provinces: Pangasinan, Nueva Ecija, Nueva Vizcaya, Tarlac, and La Union (southern part)]

Forest Station at Dagupan, Pangasinan (district headquarters):
- Benigno Alejandro — Officer in charge.
- Juan Acenas — Ranger.
- Perfecto Adamos — Ranger.
- Canuto Ducusin — Forest guard.
- Victorino Mariano — Forest guard.
- Irineo Lopez — Typist clerk.

Forest Station at San Quintin, Pangasinan:
- Amando Curaming — Officer in charge.
- Anselmo Agustin — Forest guard.

Forest Station at Bayombong, Nueva Vizcaya:
- Pedro Afalla — Officer in charge.
- Andres Toquero — Forest guard.

DISTRICT No. 5

[Provinces: Batangas, Tayabas, Laguna, and Marinduque]

Forest Station at Los Baños, Laguna:
- Theodore C. Zschokke — District forester.
- Severo Oliveros — Ranger.
- Alberto Villanueva — Ranger.
- Moises M. Montalbo — Forest guard.
- Nemesio P. Calupig — Forest guard.
- Leopoldo Miciano — Forest guard.
- Isabelo H. Alviar — Forest guard.

Forest Station at Calauag, Tayabas:
- Braulio Cristobal — Officer in charge.
- Andres Masias — Ranger.
- Felix Dayao — Forest guard.
- Albino Labaco — Forest guard.

Forest Station at Infanta, Tayabas:
- Jose Medina — Officer in charge.
- Pedro Redondo — Forest guard.

Forest Station at Laguimanoc, Tayabas:
- Pedro P. Lasquety — Officer in charge.

Forest Station at Mauban, Tayabas:
- Norberto Soloria — Officer in charge.
- Angel A. Sarmiento — Forest guard.

Forest Station at Kabibihan, via Aloneros, Tayabas:
- Gregorio Arizabal — Officer in charge.
- Sinforoso Cristobal — Forest guard.
- Castro S. Castillo — Forest guard.
- Cayetano Gamalinda — Forest guard.

DISTRICT No. 6

[Provinces: Albay, Camarines Sur, Camarines Norte, Catanduanes, and Sorsogon]

Forest Station at Naga, Camarines Sur (district headquarters):
- Macario A. Mariano — Officer in charge.
- Gregorio J. Labitag — Ranger.
- Luis Batica — Ranger.
- Inocencio Ramirez — Ranger.
- Gregorio Miras — Ranger.
- Eulogio Gines — Forest guard.
- Fermin Sol — Forest guard.
- Agapito M. Borja — Forest guard.

Forest Station at Mercedes, Camarines Norte:
- Jesus O. Duran — Officer in charge.
- Sebastian Borja — Forest guard.

Forest Station at Sorsogon, Sorsogon:
- Numeriano Valencia — Officer in charge.
- Alejandro Eguarras — Forest guard.

Forest Station at Catabañgan, Tayabas:
- Macario Simeon — Officer in charge.
- Pedro Silvestre — Forest guard.
- Vedasto Rafa — Forest guard.

Forest Station at Virac, Albay:
Ramon Mataya ..... Officer in charge.
Forest Station at Legaspi, Albay:
Filemon Kapuno ..... Officer in charge.
Pedro Aduviso ..... Ranger.

DISTRICT No. 7

[Provinces: Antique, Capiz, Iloilo, Negros Occidental, and Romblon]

Forest Station at Cadiz, Negros Occ. (district headquarters):
Jose B. Hirro ..... Officer in charge.
Pedro Gimeno ..... Ranger.
Aquilino Porciuncula ..... Ranger.
Roman Amor ..... Ranger.
Vicente Zosa ..... Ranger.
Gregorio Poblacion ..... Ranger.
Venancio G. de la Cruz ..... Forest guard.
Teodoro Oliveros ..... Forest guard.
Leon de los Reyes ..... Forest guard.
Mansueto Olaira ..... Forest guard.
Buenaventura Tubongbanua ..... Forest guard.
Forest Station at Ilog, Negros Occidental:
Maximino Rondario ..... Officer in charge.
Julian Catipay ..... Forest guard.
Forest Station at Fabrica, Negros Occidental:
Juan S. Verzosa ..... Officer in charge.
Pedro Montero ..... Ranger.
Balvino Viado ..... Ranger.
Ruperto Yzarri ..... Forest guard.
Francisco Diaz ..... Forest guard.
Francisco Castillo ..... Forest guard.
Ambrosio Canilao ..... Forest guard.
Fausto Ejercito ..... Forest guard.
Severino E. Lovero ..... Forest guard.
Forest Station at New Washington, Capiz:
Manuel Tupas ..... Officer in charge.
Alfonso B. Deloso ..... Forest guard.

DISTRICT No. 8

[Provinces: Zamboanga (except northern part), Sulu, Cotabato, and Davao]

Forest Station at Zamboanga, Zamboanga (district headquarters):
Juan Lopez ..... Officer in charge.
Florencio Asiddao ..... Ranger.
Celestino Gomes ..... Ranger.
Prudencio Florita ..... Ranger.
Pedro F. Aguilar ..... Forest guard.
Forest Station at Cotabato, Cotabato:
Jose Flores ..... Officer in charge.
Cayetano Macaraeg ..... Ranger.
Miguel R. Faustino ..... Forest guard.
Forest Station at Isabela de Basilan, Zamboanga:
Teodoro Tecson ..... Officer in charge.
Isabelo V. Ostrea ..... Forest guard.

Forest Station at Naga-Naga, Zamboanga:
- Enrique Alviar — Officer in charge.
- Gregorio L. Dagang — Ranger.
- Jose Makil — Ranger.
- Nicolas O. Luna — Forest guard.
- Cesario Medina — Forest guard.

Forest Station at Port Banga, Zamboanga:
- Santiago Babaran — Officer in charge.
- Manuel San Luis — Forest guard.

Forest Station at Davao, Davao:
- Sixto Babao — Officer in charge.
- Lorenzo Logan — Ranger.

Forest Station at Mati, Davao:
- Juan C. Andrada — Officer in charge.

Forest Station at Jolo, Sulu:
- Juan Corales — Officer in charge.

Forest Station at Margosatubig, Zamboanga:
- Bonifacio Perez — Officer in charge.
- Norberto Denoga — Ranger.
- Roman Guerrero — Forest guard.

DISTRICT No. 9

[Province: Palawan]

Forest Station at Pto. Princesa, Palawan (district headquarters):
- Mauro Ablaza — Officer in charge.
- Cornelio Miguel — Ranger.

Forest Station at Balabac, Palawan:
- Miguel Pato — Officer in charge.

DISTRICT No. 10

[Provinces: Leyte (eastern half), Samar, Surigao, and Masbate]

Forest Station at Tacloban, Leyte (district headquarters):
- Adriano V. Santos — Officer in charge.
- Agustin P. Angeles — Ranger.
- Lorenzo Diaz — Ranger.
- Perfecto Tomeldan — Ranger.
- Esteban Palmiano — Forest guard.
- Pastor M. Masangkay — Forest guard.
- Jose Sydiongco — Forest guard.

Forest Station at Catbalogan, Samar:
- Ptolomeo Causing — Officer in charge.

Forest Station at Laoang, Samar:
- Emeterio Edmilao — Officer in charge.
- Eustaquio Lagrimas — Forest guard.

Forest Station at Masbate, Masbate:
- Florentino Verzosa — Acting officer in charge.
- Rufo Rondilla — Forest guard.

Forest Station at Surigao, Surigao:
- Leon Rojas — Officer in charge.
- Simeon Montero — Ranger.

DISTRICT No. 11

[Provinces: Cavite, Rizal, Pampanga, Bataan, Bulacan, and Zambales]

Forest Station at Manila (district headquarters):
- Clemente Mariano — Officer in charge.
- Felix Mabbayag — Ranger.
- Pedro Gañgan — Ranger.
- Teodoro Mgalindan — Forest guard.
- Eugenio Mendoza — Clerk.

Forest Station at Arayat, Pampanga:
- Ambrosio Galisim — Officer in charge.

Forest Station at Limay, Bataan:
- Fausto Alambra — Officer in charge.
- Florencio M. Songco — Ranger.
- Emilio Fabila — Forest guard.
- Hilario Borromeo — Forest guard.
- Fermin Quijano — Forest guard.
- Cipriano Domingo — Forest guard.

Forest Station at Subic, Zambales:
- Carlos Guerrero — Officer in charge.
- Marcial Agayan — Forest guard.

Forest Station at Masinloc, Zambales:
- Valentin Sajor — Officer in charge.
- Valeriano V. Elgincolin — Forest guard.

Forest Station at Paysawan, Bataan:
- Vicente Villaflor — Officer in charge.
- Marcelo Udarbe — Ranger.
- Primitivo Baluyot — Forest guard.
- Deogracias F. Agustin — Forest guard.

Forest, Station at Norzagaray, Bulacan:
- Andres Bernardo — Officer in charge.

DISTRICT No. 12

[Province: Mindoro]

Forest Station at Calapan, Mindoro (district headquarters):
- Cornelio Nable Jose — Officer in charge.
- Eusebio Leuterio — Ranger.

Forest Station at San Jose, Mindoro:
- Leoncio Rebong — Officer in charge.
- Igmedio Magallona — Forest guard.

DISTRICT No. 13

Provinces: Cebu, Negros Oriental, Misamis, Bukidnon, Lanao, Agusan, Leyte (western half) and Bohol]

Forest Station at Cebu, Cebu (district headquarters):
- Isabelo Achacoso — Officer in charge.
- Silvino Reyes — Ranger.
- Leonor Lizardo — Ranger.
- Daniel B. Allas — Ranger.
- Aquilino C. Contreras — Ranger.
- Victoriano Caratao — Forest guard.
- Lucas Cabinas — Forest guard.

Forest Station at Dumaguete, Negros Oriental:	
Melecio Lopez	Officer in charge.
Venancio N. Fernandez	Forest guard.
Forest Station at Butuan, Agusan:	
Angel Mallonga	Officer in charge.
Rufo Burnea	Forest guard.
Forest Station Kolambugan, Lanao:	
Bernardo Tocmo	Officer in charge.
Lucio Abalos	Ranger.
Pedro C. Carro	Forest guard.
Guillermo Luñgay	Forest guard.
Forest Station at Dipolog, Zamboanga:	
Manuel Malana	Officer in charge.
Gregorio Quezon	Forest guard.
Jose Morandarte	Forest guard.
Forest Station at Cagayan, Misamis:	
Timoteo Quimpo	Officer in charge.
Leon Lopina	Forest guard.

DIVISION OF FOREST LANDS AND MAPS

Rafael Medina	Forester, chief.
James R. Gillis	Forester, Assistant chief.
Florencio Tamesis [1]	Assistant forester.
Cecilio Maneja	Forest supervisor.
Agapito L. Cenabre	Forest supervisor.
Severo S. Ponce	Forest supervisor.
Doroteo Soriano	Forest supervisor.
Vicente Castillo	Ranger.
Aniano David	Ranger.
Crispino Tansioco	Ranger.
Eugenio de la Cruz	Ranger.
Tomas Raboy	Ranger.
Vicente Caguioa	Ranger.
Pioquinto de la Vega	Ranger.
Leoncio A. de la Cruz	Ranger.
Fernando L. Amarillas	Ranger.
Vicente Parras	Ranger.
Victor Lara	Ranger.
Gervasio Rarang	Ranger.
Juan Oblina	Ranger.
Magdaleno Tugade	Ranger.
Joaquin Estrada	Ranger.
Juan Fontanoza	Ranger.
Celso Medrano	Ranger.
Antonio Quioait	Ranger.
Gregorio Zamuco	Ranger.
Leonardo F. Granada	Ranger.
Rafael San Pedro	Ranger.
Jose B. Logan	Ranger.
Atanasio B. Catambay	Ranger.

[1] United States pensionado.

Pio Salomon	Ranger.
Hermenegildo Bautista	Ranger.
Juan Pacheco	Ranger.
Pablo Umadhay	Ranger.
Rafael Quidilla	Ranger.
Ramon Acuña	Ranger.
Quintin Gellidon	Ranger.
Primo Icarañgal	Ranger.
Felix Jucaban	Ranger.
Jose Gerardo Pacis	Ranger.
Daniel M. Espinosa	Forest guard.
Juan Acojido	Clerk.
Eligio Cordero	Clerk.
Edilberto Barot	Clerk.
Lorenzo Abrena	Clerk.

DRAFTING SECTION

Cornelio Samaniego	Draftsman, chief.
Gregorio Vicencio	Draftsman.
Hermogenes Reyes	Draftsman.
Cecilio de la Cruz	Draftsman.
Marcelino Cruz	Draftsman.
Sebastian Domingo	Draftsman.
Cayetano Crisostomo	Draftsman.
Wenceslao Moje	Draftsman.
Alberto Gutierrez	Draftsman.
Luis Angeles	Draftsman.
Eduardo Alejandria	Draftsman.

DIVISION OF INVESTIGATION, LOS BAÑOS, LAGUNA

Otto W. Pflueger	Forester, chief.
Luis R. Salvoza [2]	Forester.
Placido Dacanay	Forester.
Harold Cuzner [2]	Technical employee.
Augustus P. West	Technical employee.
Jose F. Nano	Ranger.
Carlos Sulit	Ranger.
Alejandro de Mesa	Ranger.
Francisco L. Rola	Ranger.
Felipe Salvoza	Ranger.
Justino Seguerra	Ranger.
Andres Lemos	Ranger.
Mamerto D. Sulit	Ranger.
Nicolas Angeles	Nurseryman.
Florentino Canicosa	Nurseryman.
Maximo Pañga	Nurseryman.
Julian Rebelleza	Nurseryman.
Antonio Banasijan	Nurseryman.
Severino Casimiro	Nurseryman.
Catalino Alinzonorin	Forest guard.
Juan Quintero	Forest guard.

[2] Without compensation from the Bureau of Forestry.

Balintin Patame	Forest guard.
Alejandro Alcantara	Forest guard.
Sotero Manzanilla	Forest guard.
Braulio P. Flores	Forest guard.
Felix Columbres	Forest guard.
Fermin Manzanilla	Forest guard.
Camilo Aspiras	Clerk.

DIVISION OF SAWMILLS AND UTILIZATION [1]

William Crosby	Forester, chief.
Royce F. Wendover	Forester.
Luis J. Reyes	Forester.
M. W. Rice	Lumber inspector.
Tomas N. Roque	Ranger.
Alberto Barros	Ranger.
Benito L. Roque	Ranger.
Fortunato Manuel	Ranger.
Constantino Rabaya	Ranger.
Justo M. Pascual	Ranger.
Pablo Roque	Forest guard.
Sinforoso Apacible	Forest guard.
Doroteo Abella	Clerk.
Andres G. Ferrer	Clerk.
Aurelio Maglunog	Clerk.

ADMINISTRATIVE DIVISION

Vicente C. Ramos	Chief clerk.
Jovito Unite	Senior stenographer.
Aurea Villaruz (Miss)	Junior stenographer.

ACCOUNTING SECTION

Eugenio Tadle	Chief.
Melchor Enriquez	Clerk.
Aguedo Castro	Clerk.
Deogracias Antonio	Clerk.
Arcadio Gepiga	Clerk.
Patricio Ortega	Clerk.
Felipe Reyes	Clerk.
Crescencio Jimeno	Clerk.

PROPERTY SECTION

Cirilo Asperilla	Property clerk, cashier and disbursing officer.
Pablo D. Villena	Clerk.
Venancio Babida	Clerk.
Santiago Laya	Clerk.
Victorino Narcelles	Clerk.
Agapito Arada	Clerk.
Demetrio Saluñga	Clerk.

[1] All scalers under Division of Forest Management are also under this Division.

RECORDS SECTION

Sulpicio Olimpo	Chief.
Aquilino C. Bartolome	Clerk.
Laureano Navasca	Clerk.
Jose Salvador	Clerk.
Agustin Cardines	Clerk.
Balbino B. Nanong	Clerk.
Juan G. Loteyro	Clerk.

LIBRARY AND STATISTICAL SECTION

Simplicio Beltran	Chief.

GENERAL SERVICE SECTION

Gabino Cubos	Chauffeur.
Mariano Ocampo	Messenger.
Ruperto Mendiones	Messenger.
Pedro Marcelo	Messenger.
Bartolome Estacio	Porter.
Severino Esguerra	Watchman.
Epitacio Oblepias	Watchman.
Fernando Rañada	Janitor.
Pastor Ramos	Janitor.
Benito Zambales	Janitor.
Juan Ignacio	Janitor.
Agustin Lagan	Janitor.

APPENDIX

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certification made to the same regarding the agricultural or forest value*

Province	Received from the Bureau of Lands									Certification made to the Bureau of Lands			
	Pending from previous year				During the year 1922				Total	Agriculture			
	A. C.	H.	P.	L.	A. C.	H.	P.	L.		A. C.	H.	P.	L.
Abra		2	2						4				
Agusan		151	10	9		257	52	2	481		6		
Albay		73	9						82		18	4	
Antique		2				2			4				
Bataan		31	10	4		1	3		49				
Batanes		1							1				
Batangas													
Bohol		11		2					13		11		2
Bukidnon		24	1	5		118	1	1	150		2	1	2
Bulacan		3							3		2		
Cagayan		152	14			656	39	1	862		66		
Camarines Norte		76	6			1			83		23	1	
Camarines Sur		99	8	2		1			110		59	6	2
Capiz		19	1						20		1		
Cavite													
Cebu		11	2	3					16				
Cotabato		428	15	32		412	43	65	995		180	4	5
Davao		241	16	54		1,201	39	12	1,563		79	5	10
Ilocos Norte		2	1						3				
Ilocos Sur		19				1			20		4		
Iloilo		2	2						4		1	1	
Isabela		434	25	8		961	41	5	1,474		32	9	
Laguna		10							10		2		
Lanao		101	11	9		514	27		662		14	1	
La Union		16	2	1					19		12	1	1
Leyte		131	1						132		59	1	
Marinduque				1					1				1
Masbate		27	4	1		1	1		34		10	3	1
Mindoro		435	20	6		661	35	5	1,162		144	5	
Misamis		7	1						8		2		
Mountain Province		25	3				1		29		17		
Nueva Ecija		305	22	20		2,926	78	18	3,369		318	15	13
Nueva Vizcaya		294	16	29		738	54	1	1,132		467	17	15

TABLE No. 1.—*Statement of the public lands applications received from the Bureau of Lands, etc.*—Continued

Province	Received from the Bureau of Lands									Certification made to the Bureau of Lands			
	Pending from previous year				During the year 1922				Total	Agriculture			
	A. C.	H.	P.	L.	A. C.	H.	P.	L.		A. C.	H.	P.	L.
Occidental Negros		53		2					55		10		
Oriental Negros		7							7		1		
Palawan		57	6			1			64		32	5	
Pampanga		13	1						14		4		
Pangasinan		36	2			193	1		232		17		
Rizal		2		1		1			4				
Romblon		13	2						15		1		
Samar		29	2						31		8	1	
Sorsogon		42	1						43		15	1	
Sulu		2		2		8	1		13				
Surigao		17	1						18		2		
Tarlac		53	3			1			57		23	1	
Tayabas		670	47	3		2,703	190	21	3,634		914	33	1
Zambales		52	5	9					66		21	1	
Zamboanga		235	21	23		677	14	5	975		46	3	
Total		4,413	293	226		12,035	620	136	17,723		2,623	119	53

Province	Certification made to the Bureau of Lands					Returned to the Bureau of Lands uncertified during the year 1922				Total pending for inspection December 31, 1922				
	Forestry				Total									
	A. C.	H.	P.	L.		H.	P.	L.	Total	A. C.	H.	P.	L.	Total
Abra			1		1						2	1		3
Agusan					6		2		2		402	60	11	473
Albay		43	3		68						12	2		14
Antique											4			4
Bataan				1	1	1	3	3	7		31	10		41
Batanes											1			1
Batangas														
Bohol					13									
Bukidnon		1			6	3			3		136	1	4	141
Bulacan					2						1			1
Cagayan		27			93	13	1		14		702	52	1	755
Camarines Norte		21	1		46	3	1		4		30	3		33

Camarines Sur	14			81						27	2		29
Capiz				1						18	1		19
Cavite													
Cebu										11	2	3	16
Cotabato				189	7		1	8		653	54	91	798
Davao	6		1	101	2			2		1,355	50	55	1,460
Ilocos Norte										2	1		3
Ilocos Sur	5			9						11			11
Iloilo				2						1	1		2
Isabela				41	4			4		1,359	57	13	1,429
Laguna	3			5						5			5
Lanao	2			17	3	1		4		596	36	9	641
La Union				14						4	1		5
Leyte	15			75						57			57
Marinduque				1									
Masbate	2			16						16	2		18
Mindoro	17	2		168	5	1		6		930	47	11	988
Misamis				2						5	1		6
Mountain Province		3		20						8	1		9
Nueva Ecija	46			392	15	2	1	18		2,852	83	24	2,959
Nueva Vizcaya	4		2	505	1	1		2		560	52	13	625
Occidental Negros	4			14						39		2	41
Oriental Negros	1			2						5			5
Palawan	8			45						18	1		19
Pampanga				4	1			1		8	1		9
Pangasinan	5			22						207	3		210
Rizal	3		1	4									
Romblon	2			3						10	2		12
Samar		1		10						21			21
Sorsogon	11			27	1			1		15			15
Sulu										10	1	2	13
Surigao				2						15	1		16
Tarlac	1			25						30	2		32
Tayabas	266	10	1	1,225	91	12	1	104		2,102	182	21	2,305
Zambales	1		2	25						30	4	7	41
Zamboanga	15		1	65	2			2		849	32	27	908
Total	523	21	9	3,348	152	24	6	182		13,150	749	294	14,193

NOTE.—A. C. = Agricultural Colony of lot 16 hectares; H. = Homestead; P. = Purchase; L. = Lease.

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands, etc.*—Continued

Fiscal year	Agricultural colonies			Homesteads			Sales			Leases			Grand total
	Agriculture	Forest	Total	Agriculture	Forest	Total	Agriculture	Forest	Total	Agriculture	Forest	Total	
1905				80	6	86	8		8				94
1906				318	16	334	20	1	21	1		1	356
1907				881	19	900	23		23	12		12	935
1908				2,456	51	2,507	49	1	50	26		26	2,583
1909				1,523	187	1,710	26	3	29	27		27	1,766
1910				1,175	385	1,560	34	5	39	42	2	44	1,643
1911				1,528	221	1,749	46	3	49	30	1	31	1,829
1912				2,609	301	2,910	95	11	106	47	1	48	3,064
1913				2,680	269	2,949	104	30	134	47	1	48	3,131
1913 (July 1 to December 31)				1,653	159	1,812	81	16	97	41	3	44	1,953
1914				4,812	685	5,497	279	36	315	77	1	78	5,890
1915	1,086	28	1,114	5,965	688	6,653	317	52	369	70	1	71	8,207
1916	934	41	975	6,015	670	6,685	227	18	245	55	4	59	7,964
1917	670		670	7,632	797	8,429	457	27	484	118	6	124	9,707
1918	41		41	5,605	621	6,226	420	33	453	109	16	125	6,845
1919				5,256	790	6,046	431	51	482	137	22	159	6,687
1920				2,061	403	2,464	225	23	248	70	10	80	2,792
1921	56		56	203	25	228	33		33	13	2	15	332
1922				2,623	523	3,146	119	21	140	53	9	62	3,348
Total	2,787	69	2,856	55,075	6,816	61,891	2,994	331	3,325	975	79	1,054	69,126

SUMMARY

Applications pending from previous years	4,932	
Applications received during 1922	12,791	
		17,723
Certified for agriculture	2,795	
Certified for forestry	553	
Returned uncertified	182	
		3,530
Total pending December 31, 1922		14,193

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1922*

Species	Fiscal year—				July 1 to December 31, 1913
	1910	1911	1912	1913	
Red lauan					
White lauan	43,439	46,942	57,036	81,469	20,249
Apitong	20,764	21,096	28,929	32,391	12,905
Tangile	2,106	2,762	3,999	5,249	3,390
Guijo	14,107	14,231	18,579	17,279	7,841
Yakal	8,225	8,150	14,491	21,770	5,593
Ipil	13,717	12,296	17,237	15,791	7,535
Molave	8,923	7,978	9,091	9,363	4,783
Narra	5,744	4,996	8,474	8,877	3,941
Kalantas	3,174	1,368	938	3,320	886
Palosapis					
Mangachapuy					
Dungon	2,453	1,693	1,213	931	601
Tindalo	954	1,018	794	932	484
Akle	809	867	1,295	1,690	729
Lumbayao					
Pagatpat					
Other species:					
First group	574	322	707	1,000	687
Second group	6,667	6,644	7,988	8,543	3,266
Third group	8,316	10,927	11,796	8,711	2,999
Fourth group	36,786	41,655	42,981	59,855	25,613
Total	176,758	182,945	225,548	277,171	101,502

Species	Fiscal year—				
	1914	1915	1916	1917	1918
Red lauan					
White lauan	74,453	73,277	107,634	131,699	108,900
Apitong	32,328	38,849	52,529	55,335	56,274
Tangile	14,682	15,460	28,961	25,389	21,775
Guijo	19,701	15,650	16,685	16,857	17,301
Yakal	15,115	14,714	16,471	11,963	9,162
Ipil	17,602	12,089	14,147	16,629	15,498
Molave	9,753	10,546	10,788	13,582	22,233
Narra	8,467	9,868	7,970	5,904	7,848
Kalantas	2,423	1,999	4,574	7,381	4,975
Palosapis	2,222	1,631	2,723	3,042	8,863
Mangachapuy	1,469	1,859	2,666	2,916	2,214
Dungon	2,199	1,467	1,127	1,592	1,318
Tindalo	914	1,181	1,115	1,145	826
Akle	1,287	1,498	1,088	798	870
Lumbayao				6,085	4,415
Pagatpat				1,502	849
Other species:					
First group	2,196	2,190	3,074	1,084	1,416
Second group	9,373	6,940	7,938	6,432	7,779
Third group	7,557	6,920	5,214	9,895	8,611
Fourth group	73,017	60,130	56,738	47,661	80,933
Total	294,758	276,268	341,442	366,891	382,060

TABLE No. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1922*—Continued

Species	Fiscal year—				Total 1910 to 1922
	1919	1920	1921	1922	
Red lauan	.....	52,294	72,986	44,377	169,657
White lauan	180,556	119,833	125,536	185,853	1,356,876
Apitong	72,223	99,775	99,652	122,561	745,611
Tangile	35,005	40,903	47,311	46,978	293,970
Guijo	25,924	28,413	30,652	26,155	269,375
Yakal	18,100	20,317	28,245	28,326	220,642
Ipil	18,926	24,720	28,556	34,621	249,364
Molave	26,088	30,173	31,826	30,840	225,967
Narra	11,152	12,711	16,164	9,032	121,148
Kalantas	5,040	8,622	5,350	3,764	53,814
Palosapis	15,661	7,594	5,928	6,098	53,762
Mangachapuy	3,096	3,094	4,340	3,974	25,628
Dungon	1,839	2,607	2,726	1,829	23,595
Tindalo	1,080	1,387	2,404	1,914	16,148
Akle	937	2,047	1,553	1,441	16,909
Lumbayao	4,192	7,550	8,179	9,138	39,559
Pagatpat	2,766	4,743	5,454	2,240	17,554
Other species:					
First group	3,335	9,104	17,352	6,143	49,184
Second group	12,084	17,414	29,304	14,540	144,912
Third group	53,513	1,978	15,253	32,764	184,454
Fourth group	3,711	59,718	75,173	17,365	681,336
Total	495,228	554,997	653,944	629,953	4,959,465

TABLE No. 3.—*Revenue from public forests for the year 1922*

Province	Timber				Firewood		Minor forest products	Lease of forest land	Total
	First group	Second group	Third group	Fourth group	Bacawan tangal	Other wood			
Abra	₱3,144.87	₱1,681.95	₱441.40	₱179.47	₱97.10	₱270.43	₱158.73	.....	₱5,973.95
Agusan	2,192.70	561.42	260.99	442.93	40.73	8.64	1,202.67	.....	4,710.08
Albay	11,655.60	5,879.23	1,714.48	1,580.34	711.10	434.59	10,312.11	₱57.50	32,344.95
Antique	1,087.41	183.55	123.04	72.05	20.78	10.73	226.64	5.00	1,729.20
Bataan	132.48	1,510.23	4,373.94	5,014.61	326.82	1,275.87	2,238.71	.....	14,872.66
Batanes	.....	.....	.....	.....	.....	.....	.....	.....	.....
Batangas	1,481.73	757.32	53.64	168.22	38.40	965.01	3,311.84	20.50	6,796.66
Bohol	1,508.39	650.33	344.05	964.53	627.92	195.58	1,192.04	.....	5,482.84
Bukidnon	56.27	15.18	.....	.....	8.15	.....	44.01	.....	123.61
Bulacan	1,428.19	930.44	1,230.25	1,157.19	37.07	97.33	1,182.30	.....	6,062.77
Cagayan	10,238.60	1,663.58	3,759.89	463.23	240.50	331.63	5,827.33	508.00	23,032.76
Camarines Norte	644.10	289.26	1,598.29	571.31	402.82	42.44	854.30	.....	4,402.52
Camarines Sur	1,829.52	1,818.49	906.40	1,376.83	166.19	436.34	4,383.58	174.90	11,092.25
Capiz	331.41	274.18	496.99	1,765.69	2,404.26	945.09	1,250.38	10.50	7,478.50
Cavite	23.54	9.72	.....	.....	14.80	207.16	242.49	.....	497.71
Cebu	1,410.20	450.17	349.59	415.32	1,570.64	1,028.18	1,211.21	316.13	6,751.44
Cotabato	13,923.74	3,711.45	2,089.65	1,815.29	1,091.64	965.15	2,006.68	3.36	25,606.96
Davao	4,005.99	1,474.47	1,769.88	7,127.94	430.74	112.33	5,722.56	17.40	20,661.31
Ilocos Norte	1,373.01	844.30	306.07	133.25	150.30	46.73	72.34	.....	2,926.00
Ilocos Sur	1,136.57	147.73	67.60	84.98	2.28	324.49	152.03	11.50	1,927.18
Iloilo	20,903.55	1,391.40	1,430.34	625.32	1,222.60	1,845.77	4,415.53	132.60	31,967.11
Isabela	6,661.08	1,993.65	696.27	349.07	55.30	92.44	95.60	243.00	10,186.41
Laguna	144.95	583.64	955.09	557.89	22.91	250.95	1,211.38	.....	3,726.81
Lanao	70.93	412.26	349.43	498.75	4.02	70.19	412.80	.....	1,818.38
La Union	996.04	411.39	140.33	186.56	.....	5.24	297.07	60.00	2,096.63
Leyte	8,112.78	1,203.22	8,974.61	2,213.15	2,213.55	94.98	4,124.20	20.10	26,906.59
Manila	101,206.38	18,888.30	174,954.37	78,682.37	1,577.34	337.51	14,189.46	1,024.84	390,860.57
Marinduque	322.82	145.82	62.41	103.58	164.40	81.95	742.67	.....	1,623.65
Masbate	17,779.75	340.26	169.28	1,575.85	831.37	439.13	2,583.95	274.50	23,994.09
Mindoro	2,130.07	774.61	595.97	1,072.24	1,305.29	345.38	3,284.56	309.00	9,817.12
Misamis	1,558.41	1,308.46	2,999.51	1,079.44	83.23	115.13	1,039.71	.....	8,183.89
Mountain Province	344.50	25.07	7,407.41	29.74	.....	937.19	336.73	4.50	9,084.94
Nueva Ecija	3,429.59	879.72	205.05	120.45	1.74	49.88	2,777.98	516.00	7,980.41
Nueva Vizcaya	822.06	198.55	92.42	13.51	.....	19.65	20.90	46.75	1,213.84
Occidental Negros	5,292.64	985.81	3,431.40	5,107.28	1,205.46	855.92	4,584.76	8.70	21,471.97
Oriental Negros	1,067.54	375.49	386.34	252.52	19.30	413.73	3,894.05	73.50	6,482.47
Palawan	771.99	51.13	13.53	10.70	68.94	94.05	4,830.31	38.50	5,879.15
Pampanga	85.51	311.82	753.39	438.80	188.48	615.86	1,847.62	.....	4,241.48
Pangasinan	7,521.23	4,625.37	1,715.11	571.85	855.27	439.50	1,958.06	94.45	17,780.84
Rizal	104.24	194.62	24.70	301.15	89.63	997.83	1,103.52	1.50	2,817.19
Romblon	438.29	771.18	569.13	18.53	32.40	4.50	321.62	.....	2,155.65

TABLE NO. 3.—*Revenue from public forests for the year 1922*—Continued

Province	Timber				Firewood		Minor forest products	Lease of forest land	Total
	First group	Second group	Third group	Fourth group	Bacawan tangal	Other wood			
Samar	9,508.51	1,679.04	3,466.96	1,379.67	886.61	110.98	6,699.63	.....	23,731.40
Sorsogon	6,764.08	2,089.42	716.10	1,195.75	713.93	136.00	2,043.47	.....	13,658.75
Sulu	2,162.00	2,789.46	853.85	137.67	784.84	.....	1,221.84	.....	7,674.32
Surigao	3,158.38	1,085.22	1,473.51	583.28	733.90	264.62	3,634.70	.....	10,933.61
Tarlac	440.16	158.79	108.59	4.85	18.32	201.38	698.03	.....	1,630.12
Tayabas	26,973.48	3,235.16	3,257.35	1,601.88	4,006.17	2,939.20	14,124.74	14.00	56,251.98
Zambales	3,200.74	1,558.04	668.52	273.64	437.94	449.76	1,655.80	130.50	8,374.94
Zamboanga	11,036.45	5,198.91	19,817.69	6,730.15	2,185.83	458.24	3,405.67	.....	48,832.94
Total charges	269,466.15	68,084.17	243,773.00	117,150.36	23,797.00	16,298.42	111,724.16	4,043.79	854,337.05
Total fines	31,146.32	8,434.64	12,501.81	11,622.92	4,244.01	4,066.26	17,424.15	73.44	89,513.55
Grand total	300,612.47	76,518.81	256,274.81	128,773.28	28,041.01	20,364.68	129,148.31	4,117.23	943,850.60

NOTE.—In addition to the above revenue, ₱4,907.01 in the form of bond-deposits were confiscated for failure of the licenses without justifiable cause to manifest 60 per cent of the amount of forest products granted on their licenses.

TABLE NO. 4.—*Timber licenses issued during fiscal year 1922 (January 1 to December 31)*

Province	For less than 100 cubic meters	For 100 cubic meters and less than 1,000 cubic meters	For 1,000 cubic meters and over	License agreements	Total commercial licenses	For personal use		For public works	Miner's gratuitous licenses	Total
						Inside communal forests	Outside communal forests			
Abra	81	11	.....	.....	92	18	12	3	.....	33
Agusan	5	7	1	.....	13	4	35	3	.....	42
Albay	13	22	9	.....	44	87	21	3	2	113
Antique	11	1	.....	.....	12	1	1	3	.....	5
Bataan	6	39	3	2	50	.....	.....	3	.....	3
Batangas	.....	5	.....	.....	5	.....	5	3	.....	8
Bohol	19	1	.....	.....	20	143	5	3	.....	151
Bukidnon	1	1	.....	.....	2	.....	2	3	.....	5
Bulacan	37	11	.....	.....	48	4	2	3	5	14
Cagayan	55	39	3	.....	97	76	15	5	.....	96
Camarines Norte	11	7	3	.....	21	5	5	4	6	20

Camarines Sur	26	18	3	1	48	27	7	3	.....	37
Capiz	34	14	.....	.....	48	20	6	3	.....	29
Cavite	.....	.....	.....	.....	.....	.....	.....	3	.....	3
Cebu	37	5	1	.....	43	6	26	3	4	39
Cotabato	1	1	4	.....	6	.....	23	3	.....	26
Davao	18	22	3	.....	43	13	27	3	.....	43
Ilocos Norte	55	11	1	.....	67	41	5	3	.....	49
Ilocos Sur	42	2	.....	.....	44	32	13	7	.....	52
Iloilo	19	10	.....	.....	29	4	1	3	.....	8
Isabela	74	22	.....	.....	96	56	19	5	.....	80
Laguna	17	6	3	.....	26	.....	.....	3	.....	3
Lanao	5	1	4	1	11	.....	2	3	.....	5
La Union	26	2	.....	.....	28	21	2	6	.....	29
Leyte	63	22	6	.....	91	320	138	3	.....	461
Marinduque	5	8	.....	.....	13	.....	.....	3	.....	3
Masbate	10	35	9	2	56	56	19	3	6	84
Mindoro	14	58	4	.....	76	2	10	3	.....	15
Misamis	18	11	2	.....	31	102	22	3	.....	127
Mountain Province	42	17	4	1	64	3	7	9	1	20
Nueva Ecija	23	10	1	.....	34	111	13	5	.....	129
Nueva Vizcaya	31	2	1	.....	34	32	1	3	.....	36
Occidental Negros	13	30	6	2	51	.....	.....	3	.....	3
Oriental Negros	6	11	1	.....	18	8	11	3	.....	22
Palawan	21	21	19	.....	61	.....	20	3	.....	23
Pampanga	9	6	.....	.....	15	.....	.....	3	.....	3
Pangasinan	60	30	.....	.....	90	146	5	3	17	171
Rizal	9	2	.....	.....	11	.....	.....	3	.....	3
Romblon	9	5	2	.....	16	8	11	3	.....	22
Samar	112	30	3	.....	145	284	27	3	.....	314
Sorsogon	14	21	5	.....	40	6	2	3	.....	11
Sulu	.....	.....	5	.....	5	.....	.....	3	.....	3
Surigao	47	9	1	.....	57	96	49	3	2	150
Tarlac	12	2	.....	.....	14	53	15	3	.....	71
Tayabas	51	65	12	1	129	51	9	4	7	71
Zambales	33	8	.....	1	42	90	1	3	.....	94
Zamboanga	15	15	12	4	46	48	90	3	1	142
Total	1,210	676	131	15	2,032	1,974	684	162	51	2,871
Total (1921)	807	1,084	403	15	2,309	1,796	846	100	57	2,799
Difference	+403	—408	—272	.....	—277	+178	—162	+62	—6	+72

NOTE: + = increase; — = decrease.

In the Provinces of Cagayan, Isabela, and La Union, eighty-eight (88) licenses were issued for building tobacco curing houses.

TABLE No. 5.—*Statement of forest products, cut or gathered from registered private woodlands during the fiscal year 1922*

Province	Timber					Firewood		Charcoal	Tanbark	Split rattan
	First group	Second group	Third group	Fourth group	Total	First class	Second class			
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos*	*Kilos*
Bataan	1	12	3	3	19	.....	6	.....	.....	.....
Batangas	5	.....	.....	.....	5	99	5,471	.....	1,000	.....
Bulacan	.....	.....	.....	.....	.....	3,199	252	.....	.....	.....
Camarines Norte	.....	.....	.....	.....	.....	75	25	.....	.....	.....
Capiz	.....	.....	.....	.....	.....	118	174	.....	.....	.....
Cavite	.....	.....	.....	.....	.....	.....	50	65	.....	.....
Davao	.....	.....	4	.....	4	.....	.....	.....	.....	.....
Ilocos Norte	3	4	5	.....	12	.....	.....	.....	.....	.....
Iloilo	.....	.....	.....	.....	.....	69	749	174	.....	.....
Laguna	.....	.....	.....	.....	.....	6,824	.....	10,639	1,013	.....
Leyte	2	.....	.....	.....	2	.....	.....	.....	.....	.....
Mindoro	19	14	2	.....	35	575	.....	.....	9,421	220
Nueva Ecija	.....	.....	.....	.....	.....	.....	356	.....	.....	.....
Occidental Negros	20	5	23	102	150	.....	974	.....	.....	.....
Palawan	.....	.....	.....	.....	.....	.....	.....	.....	6,475	.....
Pampanga	.....	1	.....	3	4	25,056	13,288	276	.....	.....
Rizal	50	21	9	572	652	.....	8,527	.....	.....	.....
Romblon	.....	41	6	6	53	.....	.....	.....	.....	.....
Sorsogon	40	.....	13	2	55	.....	.....	.....	.....	.....
Tarlac	.....	3	.....	11	14	.....	892	458	.....	.....
Tayabas	1	.....	.....	.....	1	.....	.....	73	.....	50
Zambales	12	.....	.....	2	14	.....	.....	.....	.....	.....
Total	153	101	65	701	1,020	36,015	30,764	11,685	17,909	270

Province	Diliman	Daluru	Buri	White earth balls	Gogo	Lime	Nipa	Cabonegro	Hingiw	Rattan less 2 centimeters in diameter
	Kilos	*Cu. m.*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Lin. m.*
Bataan	500	.....	.....	.....	.....	.....	.....	.....	.....	.....
Batangas	.....	.....	.....	.....	1,780	28,350	.....	.....	.....	.....
Bulacan	.....	.....	.....	.....	.....	.....	823,484	.....	.....	.....
Camarines Norte	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Capiz	.....	.....	.....	.....	.....	.....	256,640	.....	.....	.....
Cavite	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Davao	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Ilocos Norte										
Iloilo										
Laguna				18,200				100	1,388	
Leyte										
Mindoro	6,300				450		3,050			2,400
Nueva Ecija										
Oriental Negros										
Palawan					320					
Pampanga		26					489,200			
Rizal										
Romblon										
Sorsogon										
Tarlac			58,005							
Tayabas										
Zambales										
Total	6,800	26	58,005	18,200	2,550	28,350	1,572,374	100	1,388	2,400

TABLE NO. 6.—*Minor products licenses issued during the fiscal year 1922 (January 1 to December 31)*

Province	Firewood	Charcoal	Dyewood	Tanbarks and dyebark	Wood oils	Almaciga resins and others	Gutta-percha	Rattan and diliman	Gogo	Sandgravel and stone	Others	Total
Abra	17							7			1	25
Agusan	5							9	1			15
Albay	18			2				26		1	2	49
Antique	3							5				8
Bataan	20	14				1		43	8		2	88
Batangas	5			1		1		1	5		4	17
Bohol	19	1							1		1	22
Bukidnon								2				2
Bulacan		8				2		5	2			17
Cagayan	11	1		3		1		40		1		57
Camarines Norte	9		1	1		2		6			5	24
Camarines Sur	22			3		8		45	1			79
Capiz	35	4		2				7	1		2	51
Cavite	4	1							6			11
Cebu	85	5							1	1	29	121
Cotabato	9			1	3		2	4			7	26
Davao	20	3			3	7		13			4	50
Ilocos Norte	8			2				1			3	14
Ilocos Sur	7	1						1		2	10	21
Iloilo	58	8	5	11				14			2	98
Isabela	13							18				31
Laguna	7	1	1		2			32	16		31	90

TABLE NO. 6.—*Minor products licenses issued during the fiscal year 1922 (January 1 to December 31)*—Continued

Province	Firewood	Charcoal	Dyewood	Tanbarks and dyebark	Wood oils	Almaciga resins and others	Gutta-percha	Rattan and diliman	Gogo	Sand gravel and stone	Others	Total
Lanao	2						1	5			6	14
La Union	1			5					1			7
Leyte	39	1			1	1		42		3	7	94
Marinduque	7			1				11	1		3	23
Masbate	20			14				30	1		3	68
Mindoro	49	1		19		1		55	15		25	165
Misamis	13							9			2	24
Mountain Province	23	7				1		16		10	3	60
Nueva Ecija	5	1				2		23	13		8	52
Nueva Vizcaya	3							11				14
Occidental Negros	53			3	4	4		111	19		13	207
Oriental Negros	12				1	1		31	5		6	56
Palawan	9		2	20		22		23	4		13	93
Pampanga	9	4						5	3		4	25
Pangasinan	28	3		27				8	4		3	73
Rizal	25	7		1				19	11		9	72
Romblon						6		3			2	11
Samar	28			2				47			2	79
Sorsogon	19	1		3	3	4		12				42
Sulu	1			3								4
Surigao	10	1		5		2		10			1	29
Tarlac				1				11	8		2	22
Tayabas	85	14		19	7	23		77	8	11	34	278
Zambales	26	5		2				27	10		9	79
Zamboanga	22	6	1	2		2	6	21	2		5	67
Total	864	98	10	153	24	91	9	886	147	29	263	2,574
Total (1921)	1,230	130	25	267	62	257	24	2,065	237	43	295	4,635
Difference	—366	—32	—15	—114	—38	—166	—15	—1,179	—90	—14	—32	—2,061

NOTE: + = Increase; — = decrease.

TABLE NO. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1922 (January 1 to December 31)*

Province	Timber					Firewood class		Charcoal	Dyewood	Tanbark
	Group				Total					
	First	Second	Third	Fourth		First	Second			
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos*	*Kilos*
Abra	1,048	1,028	354	250	2,680	.....	6,677	.....	.....	.....
Agusan	697	265	125	405	1,492	116	21	.....	.....	.....
Albay	5,093	3,354	1,543	1,165	11,155	1,519	2,216	.....	.....	4,733
Antique	376	43	89	82	590	.....	76	.....	.....	760
Bataan	39	5,060	57,004	6,448	68,551	1,402	10,192	946	.....	1,678
Batangas	156	47	35	116	354	.....	4,036	17	.....	35,434
Bohol	497	389	184	717	1,787	8,043	2,926	.....	.....	6,906
Bukidnon	23	25	.....	.....	48	.....	200	.....	.....	.....
Bulacan	586	575	1,124	1,863	4,142	630	894	814	.....	7,886
Cagayan	4,115	709	3,390	597	8,811	1,085	2,108	.....	.....	42,982
Camarines Norte	223	215	2,198	1,036	3,672	1,236	685	.....	.....	27,400
Camarines Sur	2,740	2,789	14,709	4,187	24,425	238	5,983	1	.....	94,090
Capiz	94	100	474	2,895	3,563	12,031	12,264	220	.....	800
Cavite	.....	.....	.....	.....	.....	.....	1,458	11	.....	2,533
Cebu	182	102	210	287	781	804	7,060	32	.....	2,887
Cotabato	4,794	2,029	419	1,434	8,676	2,204	5,792	.....	.....	189,700
Davao	659	620	1,082	2,023	4,384	1,307	248	73	.....	2,959
Ilocos Norte	462	449	272	165	1,348	42	363	.....	.....	11,400
Ilocos Sur	275	31	28	83	417	.....	546	.....	.....	.....
Iloilo	245	265	193	275	978	2,592	16,103	322	436,032	177,466
Isabela	1,868	1,118	640	598	4,224	.....	444	.....	.....	.....
Laguna	45	479	1,068	640	2,232	.....	3,066	1,068	50	.....
Lanao	315	846	24,146	9,355	34,662	28	176	.....	.....	.....
La Union	294	124	104	148	670	.....	1	.....	.....	24,146
Leyte	2,357	790	9,121	3,096	15,364	7,621	717	18	.....	339
Marinduque	107	137	71	131	446	5,390	2,361	33	.....	3,615
Masbate	9,586	352	416	2,362	12,716	3,697	2,070	.....	.....	22,631
Mindoro	2,507	3,653	1,277	2,632	10,069	9,998	2,573	10	.....	203,361
Misamis	446	374	1,748	1,101	3,669	255	615	.....	.....	2,240
Mountain Province	577	328	10,800	28	11,733	.....	17,437	37	.....	.....
Nueva Ecija	874	460	171	103	1,608	.....	1,547	.....	.....	1,276
Nueva Vizcaya	250	109	62	25	446	.....	631	5	.....	.....
Occidental Negros	2,379	929	60,395	123,081	186,784	7,463	7,371	4	.....	3,618
Oriental Negros	421	333	221	351	1,326	127	3,807	.....	.....	1,343
Palawan	29,676	358	45	59	30,138	454	5	.....	12,805	150,170
Pampanga	22	163	268	687	1,140	3,154	7,826	140	.....	.....

TABLE No. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1922 (January 1 to December 31)*—Continued

Province	Timber					Firewood		Charcoal	Dyewood	Tanbark
	Group				Total					
	First	Second	Third	Fourth		First	Second			
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos*	*Kilos*
Pangasinan	2,140	2,765	1,527	729	7,161	4,535	2,949	231	.....	239,227
Rizal	28	91	54	312	485	8	13,416	387	.....	10
Romblon	257	437	357	73	1,124	.....	.....	.....	.....	.....
Samar	1,971	947	2,934	1,410	7,262	5,543	291	.....	.....	180,287
Sorsogon	8,480	1,015	588	1,639	11,722	2,623	1,242	5	.....	22,586
Sulu	4,383	849	767	921	6,920	2,595	57	154	.....	108,111
Surigao	878	502	958	1,084	3,422	2,518	8	4	.....	67,141
Tarlac	208	77	94	16	395	.....	1,110	7	.....	.....
Tayabas	13,475	2,955	33,459	8,536	58,425	20,397	25,407	2,895	.....	128,476
Zambales	796	996	1,159	1,621	4,572	1,756	4,402	158	.....	.....
Zamboanga	9,443	7,216	28,273	18,452	63,384	7,470	1,129	110	.....	529,522
Total	116,081	46,498	264,156	203,218	629,953	118,881	178,506	7,702	448,887	2,297,713
Total (1921)	131,450	67,022	254,763	200,709	653,944	157,259	243,667	7,284	38,167	2,299,894
Difference	—15,369	—20,524	+9,393	+2,509	—23,991	—38,378	—65,161	+418	+410,720	—2,181

NOTE: + = increase; — = decrease.

Province	Oleo-resin	Manila copal	Daluru	Guttapercha	Split rattan	Unsplit rattan		Diliman	Limestone	Gogo
						Over 2 centimeters in diameter	2 centimeters in diameter or less			
	Liters	*Kilos*	*Cu. m.*	*Kilos*	*Kilos*	*Lin. m.*	*Lin. m.*	*Kilos*	*Kilos*	*Kilos*
Abra	.....	.....	.....	.....	.....	5,950	93,760	.....	12,940	.....
Agusan	.....	.....	.....	.....	36,184	.....	3,000	685	.....	.....
Albay	.....	.....	.....	.....	426,334	21,000	107,320	.....	.....	1,547
Antique	.....	.....	.....	.....	5,841	.....	.....	525	.....	.....
Bataan	.....	.....	.....	.....	50,371	50,120	120,375	1,529	.....	3,709
Batangas	.....	.....	.....	.....	238	.....	.....	14	.....	60,203
Bohol	354	.....	.....	.....	160	.....	4,508	1,794	.....	668

Bukidnon					1,960					
Bulacan	200	310			10,279	48,860	352,050			820
Cagayan					212,470	79,683	129,869			
Camarines Norte					154,746			620	14,050	
Camarines Sur		209,529			127,536	14,300	37,150	1,030		941
Capiz		95			9,161		5,000	845		21
Cavite					260					3,836
Cebu					915					2
Cotabato				11,940	4,476		5,000			
Davao	344	219,684			11,092	16,400	56,369	602		
Ilocos Norte					108				45,433	
Ilocos Sur								3,450	61,156	
Iloilo			5		2,763			2,842		143
Isabela					100	12,000	52,546			
Laguna	300				15,610	780	9,649	4,553		2,175
Lanao					939	7,425		7,748		
La Union										1,338
Leyte	9,910				98,054	127,190	153,192	44,409	10	
Marinduque					5,425			11,422		
Masbate					97,519			90		2,507
Mindoro			12		61,270	22,718	89,100	31,490		
Misamis		264			20,716	650	1,500	914		
Mountain Province					35,993	16,725	69,380		167,000	
Nueva Ecija					43,009	6,850	437,995	203		75,431
Nueva Vizcaya					60	2,500	21,500			
Oriental Negros	4,843	276			189,701	7,820	15,161	6,863		6,899
Occidental Negros	35,749				155,949		100	2,800		7,906
Palawan	1,020	50,370			5,275		703,371			23,568
Pampanga			129		3,932		300			2,372
Pangasinan			32		4,230	325	30,001	950		438
Rizal					22,376		5,000			3,818
Romblon	9,020	4,933			710		4,695			158
Samar	360		8		193,529	37,950	47,100	21,112		
Sorsogon	45,451	561			28,002					300
Sulu	440				2,037	375				
Surigao	473				105,681					
Tarlac					12,285		174,326			9,948
Tayabas		73,545			289,568	797,273	1,568,305	10,244		1,210
Zambales					10,137	39,650	1,778,625			14,522
Zamboanga		444	6	1,453	23,269			765		
Total	108,464	560,011	192	13,393	2,480,270	1,316,544	6,076,247	157,499	300,589	224,480
Total (1921)	158,558	589,537	531	41,271	3,170,481	1,765,138	7,002,622	216,439	312,630	137,836
Difference	—50,094	—29,526	—339	—27,878	—690,211	—448,594	—926,375	—58,940	—12,041	+86,644

NOTE: + = increase; — = decrease.

TABLE NO. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1922 (January 1 to December 31)*—Continued

Province	Stone, sand, and gravel	Buri	Guano	White earth	Nipa	Dyebark	Cabonegro	Hingiw	Fern tree
	Cu. m.	*Kilos*	*Kilos*	*Balls*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Whole*
Abra	3					300			
Agusan					14,030				
Albay	15				29,251				
Antique									
Bataan		1,600			50,744				
Batangas		113,332				2,400	8,630	1,751	
Bohol	30				317,187				
Bukidnon									
Bulacan					1,769,912				
Cagayan					74,242				
Camarines Norte	70				21,040				
Camarines Sur					37,150				
Capiz		35,928	140,000		336,304	3,652			
Cavite						180		454	
Cebu	30	459,578			52,209			5,645	
Cotabato		36							
Davao					15,940				
Ilocos Norte						4,271			
Ilocos Sur									
Iloilo		8,946			20,951			1,100	
Isabela									
Laguna		1,823		3,500			36,447	4,737	330
Lanao	10				13,110			1,272	
La Union					1,400				
Leyte	164				75,396				
Marinduque		42,061	657,856					140	
Masbate		22,063				40		780	
Mindoro		22,231			339,748	10,096		2,426	
Misamis					4,300				
Mountain Province	153								31
Nueva Ecija		66,208						150	
Nueva Vizcaya									
Occidental Negros		1,800			323,839				
Oriental Negros		10,165			5,240				
Palawan					3,066	63,790			
Pampanga	5	50,802			29,200				
Pangasinan		4,843				724			
Rizal						1,372		1,510	
Romblon		26,609							

Samar					80,056			630	
Sorsogon		67			100	2,136			
Sulu					1,700				
Surigao									
Tarlac		39,869						148	
Tayabas	3,413	325,846			5,850	5,036	981	12,542	107
Zambales					87,040	750			
Zamboanga					19,614			100	
Total	3,893	1,233,807	797,856	3,500	3,728,619	94,747	46,058	33,385	468
Total (1921)	33,210	607,806	54,275		117,735	128,569	17,963		26
Difference	—29,317	+626,001	+743,581	+3,500	+3,610,884	—33,822	+28,095	+33,385	+ 442

NOTE: + = Increase; — = decrease.

Province	Anahaw	Manila elemi	Salago bark	Beeswax	Christmas tree	Mortar (stone)	Kamagsa	Beeswax, refined	Other vines for tying
	Kilos	*Kilos*	*Kilos*	*Kilos*	*Lin. m.*	*Kilos*	*Kilos*	*Kilos*	*Kilos*
Abra									
Agusan									
Albay			2,815						
Antique									
Bataan				190					
Batangas									
Bohol									
Bukidnon									
Bulacan									
Cagayan									
Camarines Norte									
Camarines Sur									
Capiz									
Cavite									
Cebu									
Cotabato				2,381					
Davao				826					
Ilocos Norte									
Ilocos Sur						48,160			
Iloilo									
Isabela									
Laguna				67			10,631		
Lanao				117					
La Union									
Leyte		40							
Marinduque									

Province	Anahaw	Manila elemi	Salago bark	Beeswax	Christmas tree	Mortar (stone)	Kamagsa	Beeswax refined	Other vines for tying
	Kilos	*Kilos*	*Kilos*	*Kilos*	*Lin. m.*	*Kilos*	*Kilos*	*Kilos*	*Kilos*
Masbate			368						
Mindoro				1,826					
Misamis									
Mountain Province					1,009				
Nueva Ecija									
Nueva Vizcaya									
Occidental Negros									
Oriental Negros									
Palawan		4,513		6,496				185	
Pampanga									
Pangasinan									
Rizal							5,000		
Romblon									
Samar									
Sorsogon		46							
Sulu									
Surigao									
Tarlac									
Tayabas	424	32,547					5,721		
Zambales									
Zamboanga				667			220		
Total	424	37,146	3,185	12,570	1,009	48,160	21,572	185	
Total (1921)		71,586	350	7,801					20,616
Difference	+424	—34,440	+2,835	+4,769	+1,009	+48,160	+21,572	+185	—20,616

NOTE: + = Increase; — = decrease.

TABLE NO. 7.—*Statement showing the quantity and value of minor forest products exported during the fiscal year 1922 (January 1 to December 31)*

	Kilos	Value
Copal (almaciga):		
United States	214,682	₱49,556
United Kingdom	28,471	9,205
Belgium	9,025	3,300
Italy	6,000	1,100
Japanese-China	505	100
British East Indies	93,650	1₱,836
Hongkong	344	34
Japan	180,014	46,188
Australia	7,103	1,688
New Zealand	1,524	202
Total	541,318	127,209
Elemi (pili resin):		
United States	26,627	6,700
Germany	13,133	2,566
Total	39,760	9,266
Gutta-percha:		
United States	148	51
British East Indies	12,410	8,409
Total	12,558	8,460
Lumbang (Candle nut) oil:		
United States	83	56
Total	83	56
Sapan wood (sibukao):		
China	691,382	16,850
Total	691,382	16,850
Grand total		161,841

TABLE NO. 8.—*Statement of appropriation and expenditures, Bureau of Forestry (January 1 to December 31, 1922)*

Appropriation:		
Act No. 2997		₱547,200.00
Resolutions Nos. 7, 22, 25, 41, 55, 59, 72, 75, 91, 110, 133, 153, 160, and 178		20,174.31
Total		567,374.31
Less reductions:		
Overdrafts for fiscal year 1921		8,945.80
Total appropriation		558,428.51
Expenditures:		
Salaries and wages	₱350,306.67	
Traveling expenses of personnel	65,859.55	
Freight, express and delivery service	2,943.46	
Postal, telegraph and cable service	9,340.90	
Illumination and power service	3,809.37	
Miscellaneous service	1,797.94	
Rental of buildings and grounds	9,507.13	
Consumption of supplies and materials	34,728.24	
Printing and binding report	3,875.27	
Traveling expenses not government employees	400.00	
Maintenance and repair	2,084.58	
Furniture and office equipment	2,193.54	
Total expenditures		486,846.65
Balance, January 1, 1923		71,581.86
Statement of the Bureau of Forestry appropriation, expenditures and revenues for the fiscal year 1922:		
Appropriation		5₱8,428.51
Revenue and other collections		949,279.61
Expenditures		486,846.65
Surplus		462,432.9₱
Percentage of expenditures to revenue		51%

TABLE NO. 9.—*Revenues derived from the sale of forest products and expenditures of the Bureau of Forestry since its organization, April 14, 1900*

Fiscal year	Revenue	Expenses	Surplus	Expenses
				Per cent
1901 to 1906 [a]	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913 [a]	390,664	227,048	163,616	59
1913 (July 1 to December 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
1917	536,328	281,126	255,202	53
1918	650,692	334,254	316,438	51
1919	805,229	473,242	331,986	58
1920	1,009,879	541,488	468,390	54
1921	1,013,151	524,921	488,230	51
1922	949,279	486,846	462,432	51
Total	10,762,712	5,786,635	4,976,074	54

[a] Up to 1913, the fiscal year was from July 1 to June 30.

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1923

ARTHUR F. FISCHER
Director of Forestry

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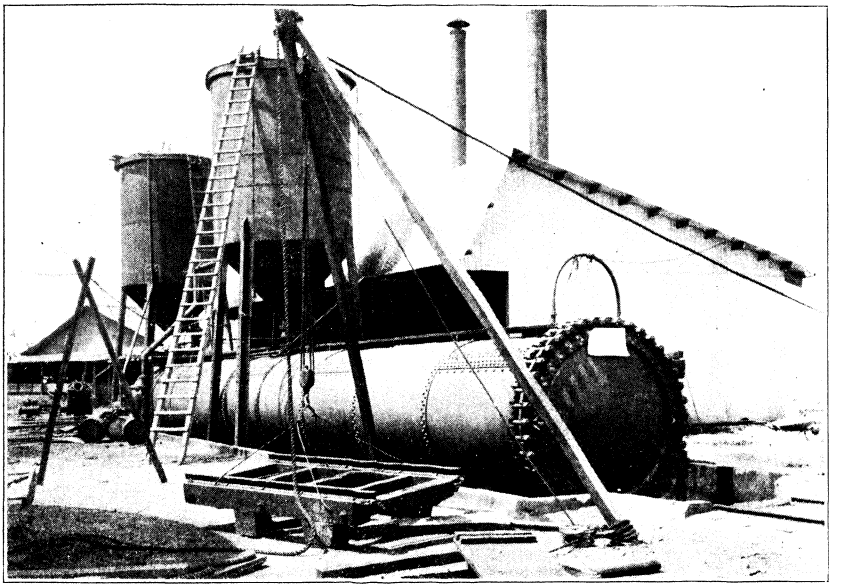
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Forestry
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The first Philippine timber creosoted with a view to the commercial development of this industry was in the year 1921, since which time the demand for it has increased as shown below:

Year	Ties	Piles and poles	Cane care framing	Bridge timber	Miscellaneous lumber	Paving blocks
	Pcs.	*Lin. M.*	*M. Bd. ft.*	*M. Bd. ft.*	*M. Bd. ft.*	*Pcs.*
1921	100	.....	.....	.....	.....	1,500
1922	5,000	1,200	.....	38,840	.....	10,000
1923	13,113	14,043	87,715	38,301	8,936	.....
1924[a]	37,604	6,192	87,538	121,609	96,349	.....

[a] From January 1 to August 31.



Creosoting Plant Atlantic Gulf and Pacific Company, Manila



Piled ties, bridge, and car timber, ready for treatment in plant

A NEW INDUSTRY IN THE PHILIPPINES

UNIV. OF MICH.

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY

MANILA, *February 21, 1924*

SIR: I have the honor to submit the Annual Report of the Bureau of Forestry for the fiscal year ending December 31, 1923. The undersigned wishes to take this occasion to acknowledge the hearty support, loyalty, and efforts of the entire personnel of the Bureau during the year.

LEGISLATION

During the year there have been a number of bills presented to the Legislature by various entities affecting directly or indirectly the interests, administration, and control of this Bureau. Such bills were referred to this Bureau for comment. They were commented upon and submitted through channels, in accordance with the instruction of the Office of the Governor-General.

A bill to amend section eighteen hundred and twenty-six of Act Numbered Twenty-seven hundred and eleven, known as the Revised Administrative Code, and for other purposes (relating to establishment of Forest Reserves for Reforestation purposes), was originally prepared by this Office and likewise submitted through channels.

The bills referred to and commented upon by this Office are the following:

1. An Act (S. No. 105) to amend section eighteen hundred and thirty-nine and eighteen hundred and forty-one of Act Numbered Twenty-seven hundred and eleven, known as the Revised Administrative Code, providing for the establishment of communal forests and pastures.

2. An Act (S. No. 154) to amend certain section of the Administrative Code, and providing for other purposes. (Defining power and function of the Bureau of Lands.)

3. An Act (H. No. 1100) to amend section fifteen hundred thirteen of Act Numbered Twenty-seven hundred and eleven, known as the Revised Administrative Code, exempting from forest charges such forest products as sibucao and firewood cut from unregistered private woodland.

4. An Act (H. No. 622) declaring free of all forest charges and intervention by the Bureau of Forestry, the cutting of timber on private land under certain conditions, and provides for other purposes.

5. An Act (H. No. 286) providing for the free cutting of timber for domestic purposes by the inhabitants of the municipalities of Pinili, Currimao, and Nueva Era, of the Province of Ilocos Norte, during a period of five years.

6. An Act (H. No. 570) to amend section two thousand seven hundred and fifty-one of the Administrative Code. (Regarding unlawful destruction of public forest.)

7. An Act (H. No. 189) exempting from payment of forest charges on all groups of timber cut for residence purposes provided the one who cuts the timber uses it for such purpose.

8. An Act (H. No. 908) to amend and compile the laws relative to the appropriations of public water for the development of water power and the use of public lands in relation thereto and for other purposes.

PERSONNEL

The inadequacy of the personnel allowed the Bureau of Forestry in its appropriation became more acute during the past year through the marked increase in activities of timber licenses and continued pressing demand for land classification, and it presents a serious problem for the coming year to perform the scaling of government timber as required by law to anywhere near the demand which is already being made by the increased number and activities of both mills and logging licenses. Due to the increased number of all kinds of lincenses issued last year and the marked increase in activities of the bureau, which is to continue this year, the present clerical force proved to be very inadequate and the same undesirable state of affairs will continue unless a remedy is provided for. The increasing pressure of the work thrown on the present personnel with the failure to provide appropriations for corresponding increases of salaries, in accordance with the schedule approved by the Governor-General, is also tending to have a demoralizing effect upon the morale and spirit of the personnel, technical as well as clerical.

After reductions of personnel due to resignations and other causes, the classified force on December 31, 1923, consisted of: 1 Director, 14 foresters (1 without compensation), 1 assistant forester, 1 technical employee, 1 forest surveyor, 11 forest supervisors (1 in the United States as pensionado), 167 rangers, 50 clerks, 8 draftsmen, and 3 messengers making a total of 257. The temporary employees were: 1 technical employee (without compensation), 2 foresters, 3 clerks, 3 draftsmen, 92 forest guards, 6 nurserymen, 2 watchmen, 1 porter, 5 janitors, 2 carpenters, 2 varnishers, and 1 laborer, making a total of 120. The entire force on December 31, 1923, was, therefore, 377.

DIVISION OF FOREST MANAGEMENT

POLICY

The policy followed by this Office is to encourage conservation through wise and lawful use of all forest resources. To carry out this policy great care is needed in granting permits or licenses for the use of the forests. As a rule preference is given to applicants who have previously been granted permits or licenses and who have shown a willingness to comply with the laws and regulations governing the use of the forest and who have also coöperated with forest officers in curtailing the illegal use of the forest resources. While there is no express provision by which foreigners are denied the privilege of using the public forests, preference is usually accorded to the citizens of the Philippine Islands or the United States. Persons or association of persons contemplating the development of forest tracts by employing machinery and modern methods of logging are also given certain preference. This Office, however, has always tried to prevent applicants from holding forest tracts for speculative purposes.

PERSONNEL

At the close of the year there were on the roll of this division the following office and field force: 1 forester, chief of division, 6 foresters, 1 assistant forester, 4 forest supervisors, 84 rangers, 51 forest guards, and 17 clerks.

ACTIVITIES OF TIMBER LICENSEES

Poor business condition in general, in addition to the appearance of rinderpest and other animal diseases, as well as the scarcity of money due to the natural timidity of capital, served to hold down the activities of the lumbermen during the first half of the year. During the second half, however, a turn for the better took place. Local demand became more active and considerable quantities of lower group lumber and timber were exported to foreign countries, notably to Japan.

FOREST STATISTICS

Early in July a section in the Division of Forest Management known as "Forest Statistics" was organized with the object of compiling all important data on the operations of licensees together with the information on conditions of forest areas as reported from time to time by our field men. The work which the new section is expected to turn out will enable us to know

the record of each licensee readily. There is enough data at hand which when consolidated will give us an idea as to the activity of licensees as far back as 10 years.

The form being used in the compilation of data on timber licensees is as follows:

1. Location of area by:
   - (*a*) District, province, and municipality.
   - (*b*) Block and compartment numbers.
   - (*c*) Size of compartment in hectares.
2. Name and address of licensee.
3. Year to which data pertains.
4. Number of license.
5. Kind of license.
6. Forest conditions:
   - (*a*) Approximate stand per hectare.
   - (*b*) Reproduction.
7. Timber manifested by groups in cubic meters.
8. Forest charges:
   - (*a*) Regular.
   - (*b*) Additional.
9. Leading species logged.
10. Violations.
11. Remarks.
    - (*a*) Number of working animals and men employed by the licensee.
    - (*b*) Activities and character of licensee.
    - (*c*) Extent of coöperation done by the licensee in eradicating illegal cuttings and the destruction of the forests.
    - (*d*) Special cutting rules that may be adopted for the protection of certain species.
    - (*e*) Species to be protected.
    - (*f*) Availability of the area for further operations.

A record showing all the above information in itemized form points out: (1) Bond deposit that may have to be forfeited; (2) area that can still be logged over; (3) licenses that should be cancelled or extended; (4) cutting rules that should be enforced for the protection of certain species; and (5) licensees that deserve to have their licenses renewed.

The following form has been prepared for fire-wood and other minor forest product licenses:

1. Planting work done by licensees.
   - (*a*) Area planted over.
   - (*b*) Species planted.
   - (*c*) Number of seeds or seedlings planted.
2. Forest products manifested.
   - (*a*) Cubic meters (firewood).
   - (*b*) Kilos (gogo, etc.)
   - (*c*) Liters (balao, etc.)
   - (*d*) Linear meters (rattan).
   - (*e*) Shingles (nipa).

Nothing has so far been done regarding the compilation of data for firewood and other minor forest products, but the plan is brought out in this report for information. The present plans may be changed from time to time as circumstances demand.

The work of this section during the last quarter has to some extent been retarded owing to pressure of other work. The personnel available had devoted a great deal of its time to work in connection with licenses. The work of the section is progressing along but no complete data are as yet available for this report. It is expected, however, that by the end of 1924, enough data shall have been compiled to merit it being embodied in the next annual report.

LICENSES

Ordinary timber licenses.—There were 43 licenses less in 1923 than in 1922—1,989 being the number of licenses issued during the year covered by this report. The decrease in the number of licenses granted is due in part to the failure to apply for renewal by those licensees in 1922 when bonds were confiscated and also to the refusal of this Office to grant permits to parties whom this Office believes intend to use their permits for speculative purposes.

Ordinary minor product licenses.—On the other hand, there was an increase of 107 in the number of ordinary minor product licenses issued this year as compared with that issued in 1922, a total of 2,681 being issued during the year. The increase in the number of ordinary minor product licenses issued during 1923 was due to the great demand for practically all kinds of minor forest products.

Gratuitous licenses.—Eighty-three more licenses were granted this year than last year—2,953 licenses were in force this year as compared with 2,871 in 1922. There were granted during the year 89 licenses for building tobacco curing houses.

Special licenses.—There were 10 special licenses issued during the year. These licenses were issued within the Friar Lands Estates the management of which has been placed under the Bureau of Forestry. Forest charges collected from holders of these licenses go to the Bureau of Lands.

Bonds.—In accordance with the requirements of Department Order No. 10 of the Honorable, the Secretary of Agriculture and Natural Resources, bonds to the value of ₱14,205.11 were forfeited in favor of the Government, and ₱4,603.31 were refunded during the year. The total amount of bond deposits on hand on December 31, 1923 was ₱144,385.14.

Fees.—In accordance with section 21 of the Forest Regulations, as amended, a nominal fee is now being charged on every private and miner's gratuitous license issued by this Bureau. During 1923 ₱947.90 was collected from this source.

License statistics.—Tables showing in detail the kind of licenses issued, amount of forest products utilized, forest charges collected during the year, and a comparison of the totals of each with those of the previous year, will be found in the appendix.

OFFENSES OF LICENSEES

One of the main functions of this Bureau is to prevent as much as possible the violations of the forest laws and regulations but as long as the personnel remains as inadequate as it is at present, it cannot be expected to materially control the amount of violation committed. The addition of new graduates from the School of Forestry in Los Baños to the Bureau's force helps some, but the annual increase is not proportionate to the increase in volume of other work required of the men. Thus, it was not possible to keep a constant supervision over the operations of licensees.

The most noticeable violations committed by licensees are: cutting undersized timber, and farming out licenses. Other offenses committed by the licensees are: (1) cutting timber outside license areas; (2) transporting timber without invoice; (3) falsifying invoices; (4) wastefull operations in the forest; (5) failure to mark the logs; (6) cutting timber in excess of the amount specified in the license, and (7) failure to properly authorize their agents.

OFFENSES OF NON-LICENSEES

Although the annual increase in the personnel has been very limited, it was possible to undertake more frequent inspection of cutting areas, more extensive field work, and more active educational propaganda among barrio people. These activities have served to reduce violations by non-licensees considerably.

SPECIAL PERMITS

There has been a very notable increase in the number of applications for special uses received during the year. There were 921 special uses applications received during the year as against 291 submitted in 1922. About 50 per cent of the number received in 1923 were for residence permits, 30 per cent for pasture permits, and the rest were distributed among fishponds, saltworks, and other special uses.

The advantages derived from the issuance of special permits under section 1838 of the Administrative Code are:

1. Better control and closer supervision of forest lands.

2. Partial checking of the occupation on public lands and the declaration of such areas as private property.

3. Additional revenue accruing to the Government in the form of rentals from this source.

This Bureau has always maintained that if given the authority to collect Government charges from forest users direct, a greater amount can be turned in to the Government than at present when the collection of forest charges is in the hands of other branches of the Government. Proof to support this contention has been submitted in previous reports. The following table will show once more what benefits the Government will derive by giving this Bureau the authority to deal directly with forest users in the matter of the collection of forest charges:

Year	Lease of forest land	Collected by—
1919	₱104.50	Bureau of Internal Revenue.
1920	355.60	Do.
1921	435.95	Do.
1922	4,117.23	Do.
1923	6,516.02	Bureau of Forestry.

NOTE.—The provinces from which the above sums were collected were listed in a separate table elsewhere in this report. Out of the 1923 collection, ₱545.50 was collected by the Bureau of Internal Revenue.

FISHPONDS AND SALTWORKS

There has been no material change in the policy laid out with respect to fishponds or saltworks. The applicants are invariably required to deposit their bonds or a portion thereof before a lease or permit is issued. In cases where the area to be developed is open land or one that has already been converted into fishponds or saltworks, ordinary permits are issued without bond. Such permits, however, are granted under the condition that, upon their expiration, all improvements on the land will revert to the Government. In case a long term agreement is entered into, the guaranty bond deposit is absolutely necessary.

There were 178 applications received as against 95 submitted in 1922 and 121 fishpond permits were issued as against 33 granted in 1922. All permits granted in 1922 had been extended to expire at the end of the year 1923. At the end of the year 150 applications were held pending, 31 for land claimed as private, 70 for failure of applicants to furnish bond deposits, and

49 for field inspection. The inspection of all constructed fishponds and saltworks will be made in the early part of next year. Permittees who have complied with the terms under which the ordinary permits are issued may be granted long term lease agreements.

PASTURES

Special effort was made at the beginning of the year to require all cattle owners using forest lands to apply for pasture permits under section 1838 of the Administrative Code. There have been received 252 applications for this purpose during the year as against 108 in 1922. One hundred fifty-two pasture permits were granted this year which, in addition to those 1922 permits extended to the end of 1923, make a total of 217 permits in force. Approximately 12,561 hectares are covered by these permits. About 12,500 heads of large cattle may be accommodated under these permits.

In order to obtain a more definite knowledge of the different plants which make up the forage crops on the pasture lands within the public forest, forest officers have been instructed to collect specimens of grasses and other plants growing on such pastures. The forest officers have been instructed to spare no effort in securing specimens from plants which are poisonous to cattle.

SPECIAL RESIDENCE OR PRIVATE CAMP PERMITS

The policy regarding the issuance of special permits as a substitute for caiñgin permits has been followed in all districts where conditions are normal. Where there is danger of shortage of food, caiñgin permits are issued.

There were 472 applications for special permits received during the year as compared with 65 in 1922 and 7 in 1921. This sudden increase is due to the fact that the Bureau of Lands stopped issuing provisional permits to homestead applicants in regions which have not as yet been declared open for disposition under Act No. 2874. Invariably such applicants are advised to apply to the Bureau of Forestry for special permits to occupy such areas under Section 1838 of the Administrative Code. The fee charged for the occupation and use of public lands under a special permit is made so low as to be within the reach of all forest users.

There were 152 permits issued, which, in addition to the 27 permits granted in 1922 and extended to expire at the end of the present year, cover an area of approximately 632 hectares. Some 46 applications were disapproved as they cover areas

unsuited for agricultural purposes, 216 are pending inspection, and 93 are held pending the receipt of annual rentals.

The holder of a special permit may be required by the Bureau of Forestry to replant the area cleared by him with seed trees furnished by the Bureau for the permit is granted under this condition. The Bureau contemplates requiring the holders of special permits covering tracts included in forest zones or forest reserves to furnish help in replanting such parts of the forest zones or forest reserves occupied by them which need reforestation. During the coming year it is planned to give this arrangement a trial in the Salinas Forest Reserve in Nueva Vizcaya. The Provincial Board of Nueva Vizcaya has appropriated, through the suggestion of the Bureau, the sum of ₱200 for this purpose. The following three tables show in detail the special permits granted and the revenue derived from rental of forest lands:

Status of special permit applications on December 31, 1923

Applications	Received		Total applications December 31, 1923	Applications disapproved		Lease cancelled		Permits cancelled		Issued previous years		Issued 1923		Lease and permits in force	Area in hectares covered by lease and permits in force	Annual rental on lease and permits in force	Pending				Total pending
	Previous years	1923		Previous years	1923	Previous years	1923	Previous years	1923	Lease	Permits	Lease	Permits				Claim	Bond	Rental	Inspection	
Fishpond	566	178	744	323	65	23	.....	....	4	38	47	.....	121	179	1,688.50	₱2,534.50	31	70	....	49	150
Saltworks	47	10	57	18	3	2	.....	....	1	12	12	.....	1	22	117.76	187.50	1	3	....	7	11
Pastures	289	252	541	50	39	.....	.....	15	30	....	168	.....	152	217	12,561.16	6,215.16	10	....	67	55	132
Residence	72	472	544	10	46	.....	.....	....	1	....	27	.....	152	178	631.08	369.50	.....	.....	93	216	309
Sawmill site	12	6	18	....	5	.....	.....	....	....	4	1	.....	6	11	45.75	72.00	.....	2	....	....	2
Sanatoria	1	....	1	.....	.....	.....	.....	....	....	1	.....	.....	.....	1	2.00	2.00	.....	.....	.....	.....	.....
Special uses	12	....	12	2	2	.....	.....	....	....	....	2	.....	.....	2	5.29	10.50	.....	.....	6	....	6
Special gratuitous permit	4	3	7	.....	.....	.....	.....	....	1	....	4	.....	3	6	.....	.....	.....	.....	.....	.....	.....
Total	1,003	921	1,924	403	160	25	.....	15	37	55	261	.....	435	616	15,051.54	9,391.16	42	75	166	327	610
Total (1922)	712	291	1,003	175	228	2	23	....	15	17	72	38	189	229	9,064.33	5,461.25	52	80	60	92	284
Difference	291	630	921	228	—68	23	—23	15	22	38	189	—38	246	387	5,987.21	3,929.91	—10	—5	106	235	326

Applications	Received		Total applications December 31, 1923	Applications disapproved		License agreements cancelled		Issued previous years		Issued		License agreements in force	Pending			Total pending
	Previous years	1923		Previous years	1923	Previous years	1923	O. M. License	1923	Previous years	1923		Claim	Inspection	Issue of agreement	
Firewood concession	11	2	13	2	2	1	4	2	.....	7	.....	2	.....	.....	.....	.....
Nipa and bacauan plantation	55	17	72	4	25	.....	.....	24	5	.....	.....	.....	.....	14	.....	14
Total	66	19	85	6	27	1	4	26	5	7	.....	2	.....	14	.....	14
Total (1922)	60	6	66	3	3	.....	1	26	.....	7	.....	6	27	.....	.....	27
Difference	6	13	19	3	24	1	3	00	5	0	.....	—4	—27	14	.....	—13

NOTE.—Minus sign (—) equals decrease.

The total amount of cash bond for Special Uses up to December 31, 1923, is ₱11,275 while the sum of ₱6,450 is covered by surety bonds. The amount of annual rental collected during the year is shown in the following table. Of the total collection of ₱6,516.02 made during this year only ₱545.50 were collected by the Bureau of Internal Revenue.

Revenue derived from annual rentals of forest land covering the period from the year 1919 to 1923

Province	1919	1920	1921	1922	1923
Abra					₱16.50
Agusan					
Albay				₱57.50	106.00
Antique				5.00	5.00
Bataan					86.50
Batanes					
Batangas			₱1.00	20.50	20.00
Bohol					
Bukidnon					
Bulacan					50.00
Cagayan			12.50	508.00	214.00
Camarines Norte					
Camarines Sur				174.90	649.26
Capiz				10.50	16.50
Cavite					
Cebu		₱86.81	61.31	316.13	419.50
Cotabato				3.36	
Davao				17.40	41.50
Ilocos Norte					81.00
Ilocos Sur				11.50	211.50
Iloilo		16.58		132.60	313.10
Isabela				243.00	312.00
Laguna					11.50
Lanao					
La Union			2.00	60.00	348.50
Leyte				20.10	
Manila	₱104.50	141.71	111.00	1,024.84	
Marinduque					
Masbate			131.00	274.50	191.00
Mindoro				309.00	199.00
Misamis					24.00
Mountain Province				4.50	101.50
Nueva Ecija				516.00	561.26
Nueva Vizcaya				46.75	384.26
Occidental Negros				8.70	28.50
Oriental Negros				73.50	96.00
Palawan				38.50	267.50
Pampanga					36.50
Pangasinan				94.45	469.64
Rizal				1.50	1.50
Romblon					
Samar					
Sorsogon		100.00	66.00		12.00
Sulu					
Surigao					
Tarlac					53.50
Tayabas		10.50	51.15	14.00	645.00
Zambales				130.50	533.50
Zamboanga					9.00
Total charges	104.50	355.60	435.96	4,043.79	6,516.02
Total fines				73.44	
Grand total	104.50	355.60	435.96	4,117.23	6,516.02

CAVES, WATERFALLS, SPRINGS, AND OTHER NATURAL RESOURCES

In order to have a definite knowledge of all caves, waterfalls, hot springs, and other natural resources located within the public forest, instructions have been issued to all forest officers to collect data on the same. It is intended to encourage their utilization, whenever advantageous to the public interests, for industrial, health, recreational, or other public purposes. The following table gives an idea of the uses to which hot springs, caves, and the like have been put:

Special natural resources

Caves, springs, and waterfalls	Present uses	Where found or location	Remarks
Danaw springs	Irrigation	Santa Matilde, Pasuquin, Ilocos Norte.	Claimed by Fermin Catalino.
Hot springs	Bathing resort	Bugias, Benguet, Mountain Province.	
Do	do	Mainit, Mountain Province.	Salty.
Hot springs	do	Bukod, Benguet, Mountain Province.	With sulphur.
Do	do	Balingay, Itogon, Mountain Province.	
Do	do	Klondyke's Gate, Benguet, Mountain Province.	Claimed by Klondyke.
Do	do	Asaray, Tublay, Benguet, Mountain Province.	
Do	do	Asin, Tublay, Benguet, Mountain Province.	Water drunk hot by natives.
Malangug hot spring	do	Lupi, Camarines Sur.	Sulphuric.
Mainit hot spring	do	Balugo, Camarines Sur.	Do.
Do	do	Wagas, Libmanan, Camarines Sur.	Do.
Hot springs	do	Pungao, San Jose, Naujan, Mindoro.	Do.
Do	do	Bagto, Canubing, Calapan, Mindoro.	Do.
Mineral spring	do	Barili, Cebu	Used commercially, claimed by M. Abad.
Do	do	Tinaan, Naga, Cebu	Improved by Mercado.
Hot springs	Bathing and drinking	Calamos, Guijulngan, Oriental Negros.	Claimed by R. Villegas
Mineral spring	do	Hilaan, Sugod, Leyte	Public.
Spring	Bathing resort	Ormoc, Leyte	Private.
Maaslam spring	Bathing	Near Fuente Osmeña, Cebu.	To be improved by Dr. Borromeo.
Cave	Guano	Peñablanca, Cagayan	Under Ibanag Mineral claim.
Pitogo Cave	do	Pitogo, Caramoan, Camarines Sur.	
Culapnit Cave	do	Bical, Libmanan, Camarines Sur.	
Caves	do	Alaminos, Pangasinan	For fertilizer.
Do	Reserve	Cave Forest Reserve, Baguio, Mountain Province.	Bureau of Forestry Reserve.
Do		City of Baguio	
Do		Sagada, Mountain Province.	Claimed by Sagada Mission.
Do	Guano	Calauag, Tayabas	Under homestead application.
Caves and cliffs	Where medicinal birds' nests are found.	Coron Island and Bacuit, Palawan.	Public.

CAIÑGINS

CAIÑGIN PERMITS

The country has not as yet fully recovered from the effects of the business depression of three years ago and as such the Bureau has been compelled to continue issuing caiñgin permits as a temporary relief measure to parties who depend for their living upon the cultivation of small tracts of land. The number of permits granted this year, however, is considerably smaller than that of the previous years. There were 5,309 permits granted in 1922 but in 1923 only 3,723 were issued. This year's permits cover an approximate area of 7,850 hectares, while those of 1922 covered about 11,391 hectares. The following table gives detailed information about caiñgin applications acted upon:

Status of caiñgin applications acted upon during the period from January 1, to December 31, 1923

Provinces	Caiñgin agreements	Collective caiñgin permits	Caiñgin permits			Area granted in hectares	Approved	Disapproved	Total number of applications received
			Public lands	Private lands	Leased lands				
Abra			6	1		17.32	7		7
Agusan			41	5		121.64	46	3	49
Albay			5	4		15.00	9		9
Antique									
Bataan			76			73.07	76		76
Batanes									
Batangas	19		3			32.18	22		22
Bohol			46	1		17.92	47		47
Bukidnon			2			1.50	2	1	3
Bulacan			24			21.97	24		24
Cagayan			106	37		243.75	143	32	175
Camarines Norte									
Camarines Sur			61	61		159.90	122	16	138
Capiz									
Cavite									
Cebu			31			31.00	31	5	36
Cotabato		7	6		2	1,582.00	15	21	36
Davao		58	321	119	21	2,283.45	519	1	520
Ilocos Norte									
Ilocos Sur			37			20.37	37	6	43
Iloilo									
Isabela			109	3	6	247.50	118		118
Laguna	114		2			87.80	116		116
Lanao			58			127.00	58	3	61
La Union			226			88.55	226	6	232
Leyte			132	12		193.58	144	1	145
Marinduque									
Masbate									
Mindoro			44			102.00	44		44
Misamis			77	41		229.67	118	19	137
Mountain Province			395			116.13	395	16	411
Nueva Ecija			25			34.00	25	17	42
Nueva Vizcaya			1	3		5.00	4		4
Occidental Negros			25	1	27	130.24	53	2	55
Oriental Negros			23	2		40.75	25	3	28
Palawan			140			310.75	140	1	141
Pampanga			1			4.00	1		1
Pangasinan			13			36.00	13	5	18
Rizal		49	335	1		410.06	385	3	388
Romblon									
Samar			69	52		79.33	121	9	130
Sorsogon			20	3		28.30	23		23

Sulu									
Surigao			29	23		49.80	52	13	65
Tarlac			1			1.00	1		1
Tayabas			189	43		314.32	232	9	241
Zambales			43	1		80.60	44		44
Zamboanga		1	231	52	1	502.55	285	8	293
Total	133	115	2,953	465	57	7,850.00	3,723	200	3,923
Total (1922)	252	6	4,476	560	15	11,395.00	5,309	152	5,461
Difference	—119	109	—1,523	—95	42	—3,545.00	—1,586	48	—1,538

NOTE.—Minus sign (—) equals decrease.

ILLEGAL CAIÑGINS

There has been a notable decrease of illegal caiñgin cases detected during the year compared with the number reported in 1922. A glance at Table No. 6–B will show that only 1,759 caiñgin violations were detected in 1923 as against 3,110 reported in the previous years. A comparison of the amount of forest products destroyed and the forest charges lost by the Government through such destruction, shows that the same had decreased by approximately 50 per cent. This is due mainly to the increased activity of the field men in checking forest destruction. Provincial fiscals, judges of the court of first instance, and justices of the peace have also demonstrated a greater desire to deal with forest offenders less leniently. This attitude on their part has also helped to reduce caiñgin making.

The procedure by which forest officers are permitted to file directly with the justices of the peace all caiñgin cases involving sums of not more than ₱200 has had a most salutary effect, and it has lessened the delay in the administration of justice, and the offenders against the forest laws are speedily given the punishment they deserve. With few exceptions, the justice of the peace courts attended to all complaints filed by forest officers promptly and in most cases imposed on the offenders the maximum penalty provided for in section 2751 of the Administrative Code. Of the total number of cases reported during the year, 1,393 were acted upon with the following result: 424 convicted, 39 acquitted, and ₱3,180.75 collected from 88 forest violators. The action taken on the remaining 67 cases is as yet not known. At the close of the year there were 366 cases pending report by forest officers.

CAIÑGIN PROPAGANDA

As a further means of checking forest destruction and illegal occupation of forest land, this Bureau intends to push more vigorously the publicity work respecting the most salient features of the Forest Law and Forest Regulations. To this end a propaganda sheet was prepared showing what privileges are allowed under the law, what acts are prohibited, and what penalties the violators must suffer. This project has been approved by the Department Secretary and at the request of this Office, the Chief of the Executive Bureau has prepared

a circular suggesting to all provincial governors that they direct municipal presidents to give the propaganda the widest publicity. Some 10,000 sheets printed both in English and Spanish have already been prepared and will be distributed in connection with the circular of the Chief of the Executive Bureau early next year. The Director of the Bureau of Non-Christian Tribes has also been requested to issue a similar circular to all provincial or municipal governments under his jurisdiction.

GAME AND FISH

As stated in last year's report, the Director of Forestry has been delegated by the Secretary of Agriculture and Natural Resources to act jointly with the Chief of the Philippine Constabulary as ex-officio executive officer for the enforcement of the Game and Fish Act (Act No. 2590). In accordance with this arrangement all the forest officers of the Bureau were appointed through an administrative circular approved by the Department Head as ex-officio deputy game wardens. The appointment was made during the early part of the year.

The following provision has been embodied in all licenses issued by the Bureau during the latter part of 1923 in order to increase a greater efficiency in the enforcement of the Hunting Law:

(*b*) Any person found hunting deer, musk deer, wild carabao, and tamaraw within or near the area described in this license during the period from May first to December fifteenth, inclusive, of every year, should be duly reported to the nearest Forest or Constabulary officers.

In order that a constructive management plan may be formulated for the game and fish problem in the Philippines, this Bureau undertook during the latter part of the year the preparation of a game and fish census in each of the different forest districts. The partial estimates submitted are shown on the following table which was compiled from the reports of the officers in charge of stations. In addition to the census data on the characteristics, habits, mating, and breeding season, food, range, etc., and economic value of the different fish and game were collected. When enough data on the subject has been obtained, this Office will submit such recommendations as will enable the Legislature to enact adequate laws for the protection and preservation of our fish and game.

Summary of the census on game and fish submitted by the different forest districts up to December 31, 1923

BIRDS

[In terms of 1,000]

Class of birds	Districts numbers													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Ducks and similar birds	50	30	....	....	50	2	1	5	....	1	....	....	7	146
Wild dove and similar birds	800	50	1	....	30	17	2	7	....	13	....	....	34	954
Kingfisher and similar birds	300	.....	1	....	....	....	....	....	....	....	....	....	....	301
Heron and similar birds	4	10	....	....	....	....	....	....	....	....	....	....	....	14
Birds of the eagle family	.....	100	1	....	....	....	....	....	....	....	....	....	....	101
Parrots and similar birds	800	10	1	....	10	6	1	4	....	9	....	....	10	851
Woodpeckers	1	.....	1	....	....	1	....	1	....	....	....	....	....	4
Kalaw and similar birds	200	10	....	....	10	2	1	2	....	20	....	....	6	251
Snipes and similar birds	.....	.....	1	....	....	10	....	1	....	....	....	....	3	15
Rail and similar birds	.....	5	....	....	....	....	....	1	....	....	....	....	....	6
Sandpiper and similar birds	1	.....	1	....	....	....	1	1	....	....	....	....	....	4
Wild chicken and similar birds	800	500	1	....	25	1	....	2	....	....	....	....	11	1,340
Miscellaneous	200	300	23	....	13	1	1	2	....	1	....	....	4	545
Total	3,156	1,015	31	....	138	40	7	26	....	44	....	....	75	4,532

or a total of 4,532,000 birds.

NOTE.—The different birds reported by the forest officers have been classified along general lines for purposes of brevity as local names differ greatly in the different provinces.

FISHES

Districts	Fresh water		Salt water fish	Total
	Mud fish	Other species		
1	1,070,000	13,000,000	.....	14,070,000
2	20,000,000	70,000,000	10,000	90,010,000
3	7,000	.....	.....	7,000
4	1,000	3,000	.....	4,000
5	20,000	204,000	.....	224,000
6	10,000	15,000	.....	25,000
7	.....	.....	.....	.....
8	9,000	7,000	.....	16,000
9	.....	.....	.....	.....
10	8,000	8,000	.....	16,000
11	.....	.....	.....	.....
12	.....	.....	.....	.....
13	47,000	29,000	160,000	236,000
Total	21,172,000	83,266,000	170,000	104,608,000

Summary of the census on game and fish submitted from the different forest districts on December 31, 1923

ANIMALS

Districts	Big game				Small game	
	Wild carabao	Tamaraw	Deer	Wild cattle	Wild cats	Lemur
1	1,300	.....	200,000	.....	40,000	.....
2	500	.....	100,000	.....	10,000	.....
3	.....	.....	5,000	.....	2,500	.....
4	.....	.....	200	.....	1,000	.....
5	200	.....	10,000	.....	7,000	.....
6	.....	.....	5,000	.....	2,000	.....
7	.....	.....	1,000	.....	.....	.....
8	.....	.....	4,500	400	700	2,000
9	.....	.....	.....	.....	.....	.....
10	.....	.....	1,000	.....	800	500
11	.....	.....	.....	.....	.....	.....
12	[a]	.....	.....	.....	.....	.....
13	100	.....	54,800	.....	2,500	2,300
Total	2,100	.....	381,500	400	66,500	4,800

Districts	Predatory		Miscellaneous	Total
	Monkey	Wild hogs	Small animals	
1	960,000	450,000	106,000	1,697,300
2	300,000	200,000	10,000	620,500
3	800	6,000	1,500	15,800
4	800	2,000	20,000	24,000
5	20,000	50,000	5,000	92,200
6	8,000	9,000	5,400	29,400
7	300	200	.....	1,500
8	10,000	15,000	.....	32,600
9	.....	.....	.....	.....
10	.....	5,000	9,000	16,300
11	.....	.....	.....	.....
12	.....	.....	.....	.....
13	24,000	30,000	59,000	172,700
Total	1,263,900	767,200	215,900	2,702,300

[a] Not estimated.

NOTE.—Of the 60 forest stations under the 13 forest districts in which the Philippines is divided only 31 have so far submitted the Games and Fish Census called for. In some instances forest officers did not give any estimates in figures. A more complete census will therefore be prepared next year.

INSPECTION

The Bureau of Forestry has been growing from year to year and as it grows in size the duties forest officers are called to perform increase in number. Projects which cannot be attended to due to lack of men are pushed through as men become available. As the Bureau grows in size, the influence of the Manila Office seems to become less felt. To surmount this difficulty, this Office deems it necessary that more frequent inspection of forest stations be made in order that the men in the field may be kept in constant touch with the Manila Office. Only experienced men either from the Central Office or the provinces are assigned to this kind of work.

The principal aim of these inspections is to render the men in the field as much assistance as possible. Rangers are examined sometimes and office records are gone into, but these examinations are made not to find fault but rather to see in what way the men can be helped in carrying out their work more efficiently. If these inspections do nothing else than to make the rangers in the field feel at all times that their progress is eagerly watched by the Manila Office and that their work carefully examined, I feel that all the expense and time used in the project are well spent. Not only the men in the field get the benefit of these inspections but also those in the Manila Office for through this personal contact the men in Manila and those in the field can come to a mutual understanding of each others' needs and problems. The two following tables show the forest stations throughout the thirteen districts inspected or visited during the year 1923 by the members of the Manila Office:

TABLE NO. 1.—*Showing forest stations inspected by the staff of the Manila office*

District No.	Stations	Number of inspection	Date of inspection	Inspected by—	Kind of inspection	Reports submitted
1	Aparri					
	Alcala					
	Claveria					
	Echague					
	Ilagan					
2	Bangued					
	Vigan					
3	Baguio					
4	Bayombong					
	Dagupan					
	San Quintin					
5	Calauag	1	August 18–20 23–25	Franco	Field and office	1
	Infanta					
	Kabibihan	1	August 21–22	Franco	Field and office	1
	Laguimanoc	1	August 14–17	do	do	1
	Los Baños					
	Mauban					
6	Catabañgan					
	Mercedes	1	February 28 to March 6	Racelis	Field and office	1
	Naga	1	March 9–17	do	do	1
	Legaspi	1	March 26–31	do	do	1
	Sorsogon	1	March 21–23	do	do	1
	Virac	1	April 2– 9	do	do	1
7	Asia					
	Cadiz					
	Calivo					
	Fabrica					
	Ilog					
8	Cotabato	1	Oct. 13–16	Gillis	Field and office	1
	Davao	1	Sept. 20–21	do	do	1
	Isabela	1	Sept. 13	do	do	1
	Jolo					
	Lumarao	1	August 2	Gillis	Field and office	1
	Mati					
	Margosatubig	1	July 27	Gillis	Field and office	1
	Naga-Naga	1	August 1–2	do	do	1
	Port Banga					
	Port Holland	1	September 8	Gillis	Field and office	1
	Port Lebak					
	Punta Flecha	1	July 24–26	Gillis	Field and office	1
	Zamboanga					
9	Balabac	1	Nov. 15–21	Racelis	Field and office	1
	Oton					
	Puerto Princesa	1	November 10	Racelis	Office	1
10	Catbalogan					
	Laoang					
	Masbate					
	Surigao					
	Tacloban					
11	Arayat					
	Almacen					
	Limay	1	April 12, 14	Zschokke	Field and office	1
	Manila					
	Norzagaray					
	Masinloc					
	Paysawan	1	April 6, 10	Zschokke	Field and office	1
	Subic					
12	Calapan					
	San Jose					
13	Butuan					
	Cebu					
	Cagayan	1	July 18–24	Racelis	Field and office	
	Dumaguete					
	Dipolog					
	Kolambugan	1	July 4–7, 14	Racelis	Field and office	1

TABLE NO. 2.—*Showing forest stations visited and partially inspected by the staff of the Manila office in connection with other work*

District No.	Stations	Date of visit	Number of times	Visited by—
1	Aparri			
	Alcala			
	Claveria			
	Echague			
	Ilagan			
2	Bangued			
	Vigan	September 23–24	1	Racelis.
3	Baguio	May 7	1	Director.
		May 3–11	1	Zschokke and Gillis.
4	Bayombong			
	Dagupan		1	Director.
	San Quintin		1	Do.
5	Calauag	November	1	Wendover.
	Infanta			
	Kabibihan			
	Laguimanoc	February 21	1	Gillis.
	Los Baños		1	Director.
	Mauban	April 1–8	1	Gillis.
6	Catabañgan			
	Mercedes			
	Naga			
	Legaspi			
	Sorsogon			
7	Asia	July	1	Wendover.
	Cadiz	Aug. and September	2	Director and Wendover.
	Calivo			
	Fabrica	Aug. and September	2	Director and Wendover.
	Ilog			
8	Cotabato			
	Davao			
	Isabela			
	Jolo			
	Lumarao	April 2–9	1	Crosby.
	Mati			
	Margosatubig	April 11–12	1	Crosby.
	Naga-Naga	April 5–6–10	1	Do.
	Port Banga		1	Do.
	Port Holland	March 24	1	Do.
	Port Lebak	April 30 and May 2	1	Do.
	Punta Flecha	April 14–15	1	Do.
	Zamboanga	March 23–27 and 29		
		October 23–24 and 29		Crosby and Tamesis.
9	Balabac			
	Oton			
	Puerto Princesa			
10	Catbalogan			
	Laoang			
	Masbate		1	Director.
	Surigao			
	Tacloban		1	Director.
11	Arayat			
	Almacen			
	Limay	Apr. 14	1	Zschokke and Dacanay.
	Manila			
	Masinloc		1	Crosby.
	Paysawan			
	Subic			
12	Calapan		1	Director.
	San Jose			
13	Butuan			
	Cebu	June 30		
		July 27–28	2	Dacanay and Racelis.
	Cagayan			
	Dumaguete			
	Dipolog			
	Kolambugan			

FOREST DISTRICTS

District No. 1: Headquarters, Aparri, Cagayan.—Provinces: Cagayan, Isabela, and northern portion of Ilocos Norte. Area: 10,155.6 square miles.

In spite of the prevalence of locusts and rinderpest, and famine in certain parts of the district, a notable progress in the lumber industry was noted this year. Both small licensees and large timber operators have continued their operations throughout the year. Lumber demands, local and export, have been good, especially toward the end of the year. More than 1,000 cubic meters of tañgile and red lauan were shipped to Japan for reconstruction purposes. Prices in the local markets have gone as high as ₱32 per cubic meter for first group and ₱24 per cubic meter for second and some lower groups.

Two important land classification projects, located in Pinappagan and vicinity, Nueva Vizcaya, covering about 2,256 hectares, were undertaken to meet the demand of the increasing number of immigrants into the Ilongot regions.

There were 248 timber licenses granted as against 228 last year. The number of private gratuitous and tobacco shed licenses was considerably larger than last year.

Collection of forest charges on nipa was recently begun. Seven licenses covering the product were issued. It is expected that next year more licenses will be issued. Forest charges amounting to ₱5,201.88, covering violations committed by licensees were turned into the Insular Treasury this year from this district. Last year ₱2,712.91 was collected from this same source. Non-licensees paid the Government ₱2,362.92 for their violation. In 1922 they paid ₱4,021.75. These figures are the result of a closer supervision in the operation in the forest.

Several applications for communal pastures have been received, most of which come from the Batanes Islands. Six parcels have already been surveyed, but their establishment as communal pastures cannot be effected until a law covering the subject is passed.

A new sawmill is being installed by the Oleaga Hermanos y Corral in Gonzaga, Cagayan. The mill of the Northern Luzon Lumber Company at Claveria, Cagayan, has undergone several improvements; a double circular saw was installed recently and preparations are being made for the construction of skyline.

A new forest zone has been surveyed on the Island of Calayan.

District No. 2: Headquarters, Vigan, Ilocos Sur.—Provinces: Ilocos Norte (except Bangui and Langangan), Ilocos Sur and Abra. Area: 3,588.8 square miles.

There has been a slight decrease in the activities of licensees due to poor market conditions. In general the attitude of the lumbermen has been very friendly. They have shown good coöperation with forest officers in reporting forest violations committed by non-licensees in and adjoining their cutting areas.

As was the case last year, there has occurred this year no forest fire of any consequence. In spite of poor market conditions, the number of licenses in force this year is greater than that of last year. The total number of ordinary timber licenses issued in the district is 167 as against 158 of last year. That of gratuitous timber license is 230 against 192 in 1922.

Constant patrol, frequent talks, and coöperation on the part of licensees and municipal authorities prevented the making of new caiñgins this year. Of the 39 caiñgin cases reported last year and tried this year, 13 resulted in conviction and 25 still pending in the courts.

There were 359 applications for leases for private residences, received this year.

Three forest zones were established during the year in the jurisdiction of the municipality of Banayoyo, Ilocos Sur.

District No. 3: Headquarters, Baguio, Mountain Province.—Subprovinces: Amburayan, Benguet, Bontoc, and Lepanto; and La Union (northern part). Area: 3,419.6 square miles.

This year marks the beginning of a return to normalcy in the lumber industry of the district. Two of the big operators in the district have doubled their annual output. The total cut of the three big concessions is 9,550.15 cubic meters.

Considering their long haul to market the firewood licensees have shown fair activity during the year. Up to November 30, they have cut and manifested a total of 8,826 cubic meters as against 11,550 last year. The smaller cut this year is due to the use of the surplus stock of last year.

The policy which has been followed in the pine forests and which has proven very satisfactory is the leaving of from 15 to 25 seed trees per hectare. Tree marking has been especially under close supervision by forest officers. In the case of the hardwood forests, owing to the sprouting ability of many of the species, regeneration in cut-over areas will take care of itself, provided caiñgins and fires are kept out. The district forester recommends burning of stand at the beginning of the

dry season as a means of minimizing the fire danger on cut-over areas.

To secure greater efficiency in the fire lookout system in use in Baguio proper it is proposed to install a telephone at the proposed lookout post on Dominican Hill and to employ at least three patrolmen to supplement the work of the lookouts during the next fire season. The use of a truck for transporting the fire fighting force is considered essential.

There were 9 forest fires reported this year, covering an area of 6.22 hectares as against 41 of last year covering an area of 145.45 hectares. It is to be regretted that owing to lack of adequate personnel, no attention could be paid to the investigation of fires occurring outside of the Baguio working circle. The best that could be done under the circumstances was to educate the people through a series of conferences and to get them to apply for pasture permits.

District No. 4: Headquarters, Dagupan, Pangasinan.—Provinces: Nueva Ecija, Nueva Vizcaya, Pangasinan, Tarlac, and La Union (southern part). Area: 8,718 square miles.

The lumber industry has been at a standstill. The timber markets were glutted and as a result prices had gone down. The demand for rattan, firewood, gogo, and tanbark, however, was good. Rinderpest, locust campaigns, lack of money and manufactured lumber brought about this unfavorable situation in the lumber industry.

There were in force during the year 179 ordinary timber licenses, which is 2 less than those issued in 1922. The number of gratuitous and minor products licenses granted this year is much less than that of the previous year.

The number of applications for pasture permits has increased by 200 per cent over that of last year. The examination of the areas applied for for pasture and for fishponds is taking up a great deal of the time of the personnel of the district.

The making of illegal caiñgins by the non-Christian tribes is one of the most difficult problems confronting the district. The opening of the San Jose–Santa Fe Road has disclosed the wholesale destruction of the forest by Igorots. Sixty-seven illegal caiñgins made by these people have been reported. Necessary warnings in the case of first offense were served to 63 offenders, and the rest were brought to court for second offense. The officer in charge reports that the Igorots along the San Jose–Santa Fe Road have expressed their willingness to settle on definite areas. It is therefore proposed to make a more

thorough study of the situation during the early part of the coming year.

District No. 5: Headquarters, Los Baños, Laguna.—Provinces: Batangas, Laguna, Marinduque, and Tayabas. Area: 6,184.9 square miles.

While several timber licensees have asked for additional grants, many will have their bonds forfeited due to their failure to cut the minimum requirement of 60 per cent of the amount granted them. There were in force during the year 183 ordinary timber licenses.

The minor forest products licensees were more active, especially those located around Guinayangan, because their products have a ready access to the Manila market due to the recent establishment of a railroad station at Aloneros. The number of minor products licenses in force during the year was 334.

There were 30 less illegal caiñgins reported this year than in 1922, but it does not necessarily mean that the destruction of the forest by caiñgin makers has actually decreased. It is certain that many caiñgin cases have not been discovered, due to the inadequacy of the patrol force.

A survey party from the Manila Office is surveying the boundaries of the Mount Banahao–San Cristobal Forest Reserve. It is expected that the work will be finished in 1924. The proposed Malepungo Forest and Mount Lobo Forest Reserve on which preliminary surveys were made in 1914 and 1919 should be established as soon as possible in order to avoid further encroachments. A preliminary survey of the boundaries of Mount Batulao Forest should also be made soon.

District No. 6: Headquarters, Naga, Camarines Sur.—Provinces: Camarines Norte, Camarines Sur, Albay, Sorsogon, and Catanduanes. Area: 6,665.5 square miles.

Poor business conditions in general are responsible for the little activity in the lumber industry during the year. The sudden stop of the demands for cross-ties by the Philippine National Bank is a severe blow to many of the timber licensees in the district. Over 30,000 ties remained unsold. However, in spite of the general business depression throughout the district, the demand for minor forest products, notably rattan, bacauan, and tangal firewoods has been very good. The commercial attractions of the rattan business are such that big firms like Hermanos E. Diaz y Cía., and Albaladejo y Cía., are now going into it.

In order to facilitate the checking up of invoices during the inspection of cutting areas, the officer in charge has given instruc-

tions to some of the big licensees to continue numbering their stumps and serially mark their logs obtained from each tree. The numbering of the stumps has enabled the licensees to keep track of every log taken from a tree, and forest officers inspecting the cutting areas can readily check up the licensees' invoices.

One hundred and sixty-one ordinary timber licenses were in force during the year, as against 165 last year. There was also noted a decrease in the number of gratuitous licenses as compared with that of last year. The required fee of ₱2 has probably something to do with this decrease. Forest charges amounting to ₱1,479.15 covering violations committed by licensees have been reported to the Provincial Treasurers for collection.

There have been issued 15 pasture permits with a total rental of ₱724 and 18 residential permits with a rental of ₱65. Applications for these special permits are increasing in number.

The number of caiñgin permits issued was 106 as against 119 of last year. The people are encouraged to secure special permits rather than caiñgin permits.

There were detected during the year 253 caiñgin cases covering an area of 118 hectares, and forest charges amounting to ₱17,265.72 were collected. There were 68 cases less than in the previous year.

The officer in charge reports that the people are complaining about the lack of public lands available for entry, despite the fact that three land classification projects have already been finished since 1920, and certified since that year to the Director of Lands.

District No. 7: Headquarters, Cadiz, Occidental Negros.—Provinces: Antique, Capiz, Iloilo, and Occidental Negros. Area: 8,332.9 square miles.

The recent Japanese earthquake, combined with good sugar prices, has created a favorable situation in the lumber market. The majority of the licensees in the district have been in active operation, particularly during the last half of the year. Several timber operators have asked for authority to cut additional amounts under their licenses. Lumber prices jumped from 10 to 20 per cent over those of last year.

Activity in the line of the minor forest products was steady except in the case of sibucao, the demand for dyewood in China having been very poor during the year.

Only 22 of the 137 ordinary timber licenses in force in the District were inspected due to lack of personnel.

It is very gratifying to note the big collection of forest charges made from both licensees and non-licensees, amounting to ₱28,914.56, which is about five times greater than that of last year,—the biggest collection so far that has ever been made in the district. A big portion of this amount comes from cases which have been reported in previous years.

District No. 8: Headquarters, Zamboanga, Zamboanga.—Provinces: Cotabato, Davao, Jolo, Zamboanga (except Dapitan and Dipolog), and southern Lanao. Area: 22,576 square miles.

The lumber shipped by the big mills showed an increase of 12.65 per cent over that of last year, which is a good sign of the return to normal conditions. Although foreign shipments have shown considerable falling off, there has been in general no accumulation of stocks in the lumber yards for any extended time. The requirement that only seasoned lumber be shipped to Australia has accounted a great deal for the decrease in export shipments.

The different companies are now coming to realize that hand logging must go and modern methods must take its place. Several purchases of locomotives and machine-logging equipment have been made recently.

Nine hundred and sixty-nine caiñgin permits were issued during the first eleven months of the year which showed a very considerable increase over those of last year. This large difference may be accounted for in part by the issuance last year of 52 blanket permits covering more than 1,000 persons. The increase in the number of caiñgin permits is not a sign of conditions growing worse, but rather a distinct gain, because the caiñgin-makers now recognize the right of the Government to demand permits for clearing. Education and propaganda are emphasized as a means of combatting the caiñgin evil.

There were two land classification projects undertaken during the year; one in Zamboanga and the other in Davao.

The district forester reports that there is very little public sentiment in favor of the game laws, hence the difficulty of their enforcement. There is a great scarcity of most species of birds even in uninhabited streches of the forest. The pelican, a beautiful and conspicuous bird in the marsh, is most in need of protection.

District No. 9: Headquarters, Puerto Princesa, Palawan.—Province, Palawan. Area: 5,617 square miles.

All the timber licensees have worked steadily throughout the year. Some cuttings have been made of kalantas and marango but the demand was easily supplied and the timber operators

have had to turn back their attention largely to ipil, narra, and other first group species. A notable advance made this year was the shipment of some 250,000 board feet of lumber, besides the usual export of squared timbers.

The activities of the minor forest products licensees have likewise shown marked improvement over those of last year.

Two reconnaissance projects were undertaken in the district this year; one in Puerto Princesa Peninsula and the other in the Aborlan Reservation.

The number of ordinary timber licenses in force was 60 as against 56 last year. The number of gratuitous timber licenses remained practically the same.

Of the 54 caiñgin cases reported this year 27 resulted in conviction, 4 in acquittal, and 13 are still pending. The most persistent caiñgin violators were from the non-Christian tribes. The policy of the province to concentrate these tribes in places along the seacoast has been continued with the result that large areas covered with non-commercial forests but suitable for agriculture were opened up.

There are three sawmills in operation in the district. Considerable time of the rangers was taken up in scaling work at these mills. The daily capacity of these mills ranges from 8,000 to 16,000 board feet. The installation of these sawmills should benefit the people in Palawan as it would bring the prices of lumber within the reach of everyone. It should also enable licensees to utilize most of the lower group species.

Auxiliary invoices submitted against licensees amounted to ₱2,004.80 as against ₱280.85 last year. The sudden jump in collection is due to the addition of two men to the personnel of the district.

District No. 10: Headquarters, Tacloban, Leyte.—Provinces: Samar, Leyte (eastern part), Surigao, and Masbate. Area: 11,124.2 quare miles.

Lumber market conditions are slightly better than those of last year. Most of the lumber produced in this district has been consumed locally, but a considerable amount has been shipped to Manila from Masbate. About 20,000 board feet of lumber have been shipped to the United States.

Tie-making in the district has been revived owing somewhat to the demands for this product in Negros, Iloilo, and Cebu.

In the matter of minor forest products, firewood and rattan have shown marked activity. Tacloban promises to be a big market for rattan produced in the district, owing to the establishment in that town of several furniture shops.

The number of timber licenses in force during the year was 283 as against 340 in 1922. The decrease was due largely to the fear on the part of many old licensees of the forfeiture of their bonds, should they fail to invoice 60 per cent of the amount granted them in their licenses.

Auxiliary invoices amounting to ₱6,867.73 covering violations committed by licensees and ₱6,067.17 by non-licensees were submitted this year.

In order to give as much relief as possible to the typhoon-stricken people in Samar, six municipalities, namely, Basey, Borongan, Hernani, Llorente, Oras, and Villareal have had their communal forests cancelled temporarily. The action enables the inhabitants thereof to cut or gather forest products for personal use from any part of the public forest most convenient to them.

It is very gratifying to note that in Leyte and Surigao there have been fewer caiñgin cases this year than last year. This was due to the coöperation rendered by municipal and provincial officials and the activity of the forest officers. In Masbate and Samar, however, caiñgin-making has gone on as usual.

The 13 sawmills in the district have shown a slight increase in activity this year over the previous year.

District No. 11: Headquarters, Manila.—Provinces: Bataan, Bulacan, Cavite, Pampanga, Rizal, and Zambales. Area: 5,106.1 square miles.

Little activity has been noted in the lumber industry owing to the monetary crisis, in addition to public calamities such as typhoons, rinderpest, locusts, etc.

Activities in the minor forest products industry, however, have been above normal. Licensees for gogo and rattan in Pampanga have been unable to meet the demands for these products. Buri and boho have also been active in the local markets.

As usual the Cadwallader-Gibson Lumber Company was the only operator in active operation throughout the year. The demand for bancas in Bataan has, however, remained steady.

Two serious fires occurred in the cutting areas of the Cadwallader-Gibson Lumber Company at Paysawan. The origin of these fires was supposed to be from locomotive sparks. The company in one of these fires suffered a loss of 2,520 cubic meters of timber.

The number of timber licenses in force during the year is practically the same as that of last year, the number being 167 as against 168 in 1922. The number of minor products licenses shows a substantial increase.

The officer in charge reports 263 violations committed by non-licensees involving ₱3,677.82 as forest charges and 149 violations by licensees covering ₱1,722.18. The number of violations have decreased considerably as compared with those of last year because of greater activity on the part of the forest officers.

There were 542 caiñgin permits granted this year as against 426 of last year. Eighty-four cases of illegal caiñgins have been reported.

One forest zone was established in Iba, Zambales, during the latter part of the year.

District No. 12: Headquarters, Calapan, Mindoro.—Province, Mindoro. Area: 3,981.6 square miles.

Poor markets and lack of capital caused the unsatisfactory condition of the lumber industry in the district. Only a few of the bigger licensees were able to conduct fairly active operations throughout the year.

Because it does not pay to cut species other than those demanded in the market, only kalantas, guijo, narra, ipil, tindalo, and supa are cut by licensees. This practice has gone on for years and as a result these species are becoming rare. Steps should be taken for the reforestation of these species.

The number of timber licenses in force during the year was 98 as against 73 last year.

It is gratifying to note, as a result of more frequent inspection, a notable decrease in the number of illegal cuttings committed by licensees.

The people have not taken advantage of the free use privilege. The majority of the local people prefer to fill their lumber needs from Manila as this practice has resulted cheaper for them in the long run. Much timber for pesonal use has also been obtained from approved homestead.

Illegal caiñgins have decreased especially in the municipality of Abra de Ilog, Mindoro.

District No. 13: Headquarters, Cebu, Cebu.—Provinces: Agusan, Bohol, Bukidnon, Negros Oriental, and Zamboanga (northern part). Area: 20,531 square miles.

Conditions in the lumber industry are in general fairly good. With the exception of Agusan, where the supply far exceeded local demands resulting in the closing of several licensees' operations, local markets have been active, particularly in Dapitan, Dipolog, Zamboanga, and Oriental Negros. Good business conditions in general as a result of good markets for sugar and

copra are the reason for the favorable lumber situation in the latter province.

It is interesting to note the two virgin forest tracts observed by forest officers in the district: one is located between Ormoc and Pinamopoan, Leyte, and is of the lauan-apitong type, and the other is found north of Mount Sinomoc and the Cavite River in the municipality of Dapitan.

There have been in force during the year 173 ordinary timber lincenses, which number is practically the same as that of last year—only one less. The number of minor products licenses granted is 284.

The officer in charge reports a heavy overcutting of the mangrove swamps in Cebu, Bohol, and Oriental Negros, due to the great demand for firewood in these provinces. The present system of leaving the work of replacing these mangrove areas to the licensees themselves may work satisfactorily, provided a closer supervision is maintained by competent forest officers.

Three hundred and forty-one caiñgin permits have been granted during the year, as against 495 last year. Of illegal caiñgin, 323 cases have been reported as against 181 last year. The great increase is due partly to the fact that many cases detected in the past two years were reported only this year, and partly to the greater attention paid to this work this year. It is gratifying to note that out of the 213 cases acted upon, only 13 have resulted in acquittal. Satisfactory results were obtained through immediate presentation of the cases directly to the justice of the peace in the municipality where the caiñgins have been made.

Land classification work was begun at Bukidnon, Lanao, but owing to the recent disturbances there, the work was left unfinished. The party in this assignment is now working in the northern part of Zamboanga within the jurisdiction of Dipolog Station. It is planned, if men are available, to establish a forest zone in the municipality of Toledo, Cebu, this coming year.

The officer in charge reports a suitable sawmill site in the barrio of Paraplona, Tanjay, Oriental Negros.

DIVISION OF INVESTIGATION

1. RECONNAISSANCE

The only reconnaissance conducted during the year by this division was that of the area covered by the Port Lebak Lumber Co., Inc. The concession borders on the Moro Gulf within the municipal districts of Awang, Salaman, and Port Lebak. It ex-

tends from Kidapil Point on the north, south along the coast to the Palimba River and ten kilometers into the interior. The area of this concession is approximately 73,522 hectares. The area covered by the reconnaissance is approximately 50,000 hectares and extends from the Tran River to Palimban Point. The classes of 1923 and 1924 took part in the reconnaissance. The time spent in this work was from April 15 to June 30, 1923. The region covered was divided into six main sub-areas, based mainly on topography. The following table shows the vegetation type of the different sub-areas:

Table showing the areas in hectares by vegetative types and topographic divisions covered by the reconnaissance, Port Lebak, Cotabato

Vegetative type	Cebayor	Limulan	Babankao	Wasag	Miduol	Palimban	Total
Commercial forest	1,843.50	1,514.25	796.24	571.15	648.35	603.72	5,977.22
Noncommercial forest	510.46	276.58	97.40	207.51	457.55	1,168.40	2,717.90
Cogon, caiñgins, and open land	93.81	21.32	92.72	22.44	22.30	13.00	265.59
Total	2,447.77	1,812.15	986.36	801.10	1,128.21	1,785.12	8,960.71

NOTE.—The statement that 50,000 hectares were covered in this reconnaisance, whereas this table only gives 8,976.71. The reason for this is that large areas were covered by meander lines no strips being run; and, therefore, no maps were made for them.

2. DENDROLOGY

All the work in this subject was in connection with the instruction given in the School of Forestry. The making of drawings by the students from botanical material collected by them or from herbarium material has brought good results. This is resorted to particularly in the case of species difficult to identify.

The following work has been done, mainly by the rangers in charge of the field work:

(*a*) Embossed labels were made to continue the labeling of all important trees on the trail to the Mud Spring. This is being done for the benefit of visitors.

(*b*) Botanical collection has been extended to Mount Lobo, Batangas; Paete, Laguna; and Port Lebak, Cotabato, in connection with the ordinary routine work and the reconnaissance carried on by the Division. The total number of botanical specimens collected is 48, 16 of which were from Mount Lobo, 13 from Paete, and 19 from Port Lebak. These were sent to the Bureau of Science for identification. This collection does not include the specimens collected by the students from Mount Makiling for the purpose of study.

(*c*) At present the herbarium contains 2,927 specimens, 137 of which, as an increase over 1922, were received from the

Manila Office. The fact that Doctor Merrill of the Bureau of Science left for the States, this year, is the reason why few mounted specimens were received by the Division.

3. UTILIZATION

(*a*) *Lumbering.*—The lumber operation of the Port Lebak Lumber Company was studied in connection with the reconnaissance.

As in the previous year this Division is receiving sawmill reports from the rangers in the field. These reports are being used in connection with the course in Lumbering and Utilization in the School of Forestry. Inasmuch as the School of Forestry students have very little opportunity to see logging and sawmilling operations it will be of great value and will help them a great deal if copies of sketches of cutting areas, railroad lines and the sawmill plan, including the ground and floor plan of the sawmill, can be sent in connection with the sawmill reports from each sawmill.

(*b*) *Minor forest products*—(1) *Charcoal kilns.*—The two charcoal kilns constructed in Hectare A during the latter part of 1921 are still in good condition. During the year they were kept in continuous operation. The greater part of the charcoal manufactured to the end of 1923 was of mixed species, the reason for this being that the good species for firewood in the School of Forestry plantations, such as ipil-ipil, guava, and tikis-tikis, had already been over cut in past years. In the smaller kiln pure coconut shells, coconut husks, and a few forest tree species were burned during the early part of this year. The following table shows the results obtained from this year's operation:

	Small kiln	Big kiln
Number of charges	43	18
Number of cubic meters of wood used	51	162
Number of cubic meters of charcoal produced	18	75
Average per cent of utilization	34	46
Number of rice-sacks of charcoal obtained	214	905
Average number of rice-sacks per batch	5	50
Average weight per sack in kilos	14	15
Number of kilos of charcoal obtained	3,034	3,578
Approximate cost of producing one kilo	₱0.05	₱0.035
Approximate cost of producing one cubic meter	9.80	7.35

The cost this year of producing one kilo of charcoal in the large kiln varied from 3 to 4 centavos, and that of the small kiln at 5 centavos. The cost of production was high due to the fact that the charcoal men selected the trees among the planted species in the plantation, hence it took a long time to assemble

the wood at convenient places for transportation to the kilns. About 12,241 kilos or approximately 58.2 cubic meters of the charcoal burned during the year were sold at the cost of production to students and members of the faculty of the College of Agriculture, and to some outsiders. The total amount already collected from the sale of charcoal to the end of 1923 amounted to ₱394.54. Trained laborers were kept continually at this work. Their work consisted of cutting firewood for the kilns, attending to the charging, firing, discharging, sacking and weighing of the charcoal. Part of the time they were assisted by another laborer in transporting firewood to the kilns.

The distillate from the smoke of the coconut shells, coconut husks, and other forest tree species in the small kiln was sent to the Chemistry Department of the College of Agriculture for analysis. This Office has not as yet been informed of the results obtained.

(2) *Other products.*—As in the past, the collection of vines, cabonegro and other materials was made and the collection of data on other products was continued. Some investigations of the oils of Hydnocarpus, Palomaria, and other oil-producing species were made by the Department of Chemistry at the College of Agriculture.

The measurement of planted trees in the plantations was made during the month of June. On account of the height already reached by the trees, only the diameters at breast height were measured.

4. FOREST ENGINEERING

(*a*) *Field work.*—Topographic notes were secured in connection with the valuation surveys in the Port Lebak reconnaissance.

(*b*) *Office work.*—(1) Topographic maps and vegetative and topographic maps of the regions within the concession of the Port Lebak Lumber Company have been prepared on the scale of 1 : 5,000 and contour interval of 20 meters. These regions are as follows:

1. Cebayor drainage area.
2. Limulan Valley.
3. Babankao region.
4. Namat Valley (vegetative map only).
5. Miduol region.
6. Wasag region.
7. Palimban Valley.
8. Tran region (vegetative map only).

(2) The topographic maps and the topographic and vegetative maps of the entire Makiling National Botanic Garden were finished up this year. They are now ready for blue printing.

(3) The topographic maps and the topographic and vegetative maps of the last four blocks (Solokin, Summit, Dampalit, and Dipangla) which were also finished up this year are now ready for blue printing.

The descriptions of boundaries, vegetation, and topography of these blocks were submitted to the Director of Forestry last year in the Annual Report. As stated in the report last year the final report on the Makiling Reconnaissance will be submitted as soon as the computations and other data are arranged.

5. FOREST MANAGEMENT

(*a*) *Growth studies.*—(1) The measurement of the eight species in Mount Makiling for 1923 is not finished. This is due to the fact that the work is being done only on some Saturdays whereas in previous years the work was done during the summer. The old scheme could not be followed because the men working on this job were also members of the reconnaissance party at Port Lebak which lasted till the end of June. However, the measurement of these trees will be accomplished very soon.

(2) The diameter growth of the Pure Bagtican Stand near the School of Forestry was measured during the Christmas vacation.

(3) The measurement of the diameter growth of trees in the School of Forestry plantation was made last summer. No height measurement was taken, as it is no longer feasible to obtain accurate results, because most of the trees are now very high. However, sufficient data have been secured during the past years.

In these growth studies we are very much behind in some important species of commercial importance like apitong, yakal, and other dipterocarp species as well as other species that are hard to grow in the School of Forestry plantation or are not found on Mount Makiling. It is therefore necessary to start growth studies in places where these species are abundant, so that in the future we will have the data on growth for all species of commercial importance which are indispensable in our work in management, reforestation, and instruction in the School of Forestry.

(*b*) *Timber estimating.*—Valuation surveys were taken in connection with the mapping work in the Port Lebak Reconnaissance. The notes were used in the preparation of stand and stock tables.

(*c*) *Working plan for Makiling Forest.*—This year the work was confined to checking the combined tables on number of trees and on volume for the entire Makiling National Botanic Garden.

It is expected that the tables will be finished before the end of this school year. The work on the compartments will be resumed next year.

6. SILVICULTURE

(*a*) *Reforestation.*—In the report for last year, the problems in reforestation were outlined. During 1923 various activities were carried on tending to solve the problems mentioned above. The importance of reforestation in the Islands is so keenly felt in some regions that in this report the recommendations made in all of the past reports regarding the setting aside of a sum of money for carrying on the work are reiterated. We cannot expect very good results, unless there are funds available and sufficient force to carry on the work. During the last year, there have been several requests received at this office for the inspection of areas intended for reforestation by private individuals as well as haciendas and companies. Due to the lack of men, these requests were not attended to, and we were forced to state that the inspection will be made at some future date. Unless more men are added to the present force, it is very doubtful if they can be attended to next year.

The volume of work in the projects widely scattered over the Islands is increasing so rapidly that the few men can hardly cope with it. However, despite the difficulties encountered this year, the officer in charge of Reforestation Projects has endeavored to push on the work so as to keep pace with the progress of the other projects of the Bureau. Although the progress of reforestation is far behind when compared with the progress of the other activities of the Bureau as a result of the lack of funds, yet we feel that we are gradually gaining the coöperation of the public, so that when conditions permit the carrying on of extensive work, public opinion will have been moulded and ready to back it up.

As land classification progresses, the absolute forest lands which are now covered with cogon will be definitely known, and the planting of these areas will become important, thus eventually more men and fixed annual appropriations will be needed to carry on the work.

(1) *Personnel.*—At present the personnel is composed of one forester who is in charge of the projects; one forest supervisor, who is in charge of the planting work in the Makiling National Botanic Garden; one ranger, who is in charge of the projects in Ilocos and in Zambales; and one senior ranger, who has been recently stationed in Cebu to take care of the work in the

Talisay–Minglanilla Forest Reserve and in the Visayan Islands. If it is remembered that planting is done during the rainy season, the difficulties experienced by the men engaged in this work will be appreciated, especially so, if various projects are scattered among several towns within a large district, as in the Ilocos region. In this particular district, the forest officer has to go from one town to another under trying conditions during the rainy season, which covers a rather limited period in that region.

The work in the Talisay–Minglanilla Forest Reserve, Cebu, has been neglected since the closing of the forest station at Talisay about five years ago. But in the early part of November of this year, Ranger Maximo Oro was sent to continue the work.

(2) *Policy.*—In 1922 the reforestation policy of the Bureau of Forestry was laid out and approved. During the year it was strictly followed in carrying on the various projects. In order to carry out the policy on a large scale, large appropriations and adequate personnel will be needed.

The reforestation of waste lands is a work which has gone beyond the experimental stage. Other countries which have experienced the evil results from waste lands, are appropriating large sums of money to be expended in bringing these lands to a state of productivity. We should profit by the experience of other countries, hence the planting of the vast areas of cogon lands now lying idle is a problem which should receive immediate and serious consideration in the Islands.

(3) *Progress of the various projects.*—(*a*) *Ilocos Reforestation.*—This year the work in Ilocos was entirely supervised by Ranger F. L. Rola, who was transferred to Vigan, Ilocos Sur, from Los Baños, Laguna, in the early part of this year. The seedlings in the Cañao nursery were planted in the Vigan demonstration plot on July 27 and 28.

The total area planted was approximately one hectare. The soil was deep clay with some stones scattered here and there. The species planted were as follows:

Molave	81
Acle	33
Albizzia lebbeck	420
Ipil	168
Tindalo	20
Supa	300
Teak	1,075
Total	2,097

The total cost of planting including supervision was ₱12.35 or an average cost of about ₱6 per thousand.

On account of the lack of funds, the forest nursery in Vigan is the only nursery in Ilocos which is expected to be taken care of next year. At present, there are seedlings of molave and narra in the nursery, which will be used for planting next year. The most urgent need of the work in Vigan is a trained nurseryman to take care of the nursery. A forest guard is at present employed temporarily to do this work.

(*b*) *Santa, Ilocos Sur.*—The planting in the demonstration plot of Santa was done on July 9, and August 7, 1923, under the direct supervision of Ranger Rola assisted by Forest Guards Navarro and Balbuena of Vigan Forest Station.

The area planted was inside the communal forest of that municipality, and covered an area of about one hectare. The soil was deep sandy clay, but gravel was scattered here and there. Heavy rains fell before and after planting. The species planted were as follows:

Albizzia lebbeck	70
Molave	53
Supa	250
Teak	1,581
Total	1,954

The labor used in planting was furnished by the municipality of Santa.

(*c*) *Sarrat, Ilocos Norte.*—During the year there was no planting done in Sarrat, Ilocos Norte. The demonstration plot, however, was inspected by Foresters Laraya and Zschokke and Ranger Rola on June 7, 1923. During the inspection it was found that in the southern part of the area the ipil-ipil trees were small and that it will require two years more before they are worth cutting. In the northern part of the area there were found large ipil-ipil trees which will furnish large quantity of firewood in two years more, when cut together with the shrubs growing with them. In the grassy portion of the area the ipil-ipil seedlings were found to be only from 20 to 40 centimeters in height. In general the demonstration plot was found to be a success, the bigger ipil-ipil trees being on the average of four meters in height and 8.5 centimeters in circumference.

(*d*) *Pasuquin, Ilocos Norte.*—No planting was done in Pasuquin during the year. The demonstration area, however, was inspected by Foresters Laraya and Zschokke and Ranger Francisco Rola on June 5, 1923. In the grassy portion of the plot no seedlings were found. This was due to the fact that grazing was allowed by the people in its neighborhood.

Under the low shrubs, however, there were ipil-ipil seedlings about one-half meter in height. The area selected for this planting was typical of the land of that region, and the failure was due to grazing and fire which were allowed in the area. Not very much can be expected from this work at present, unless proper coöperation of the people of Pasuquin is received by the Bureau.

(*e*) *Currimao, Ilocos Norte.*—An interesting piece of work in reforestation contemplated during the year was the reforestation of sand dunes in Currimao, Ilocos Norte. The sand dune menace, however, is not serious at present; nevertheless this office is taking steps to control it, inasmuch as even a slight movement of sand may become a danger in a few days under certain conditions. On account of the lack of funds, this office has adopted a policy by which protection of agricultural land from sand dunes can be handled so easily and at such a slight expense that it should be carried on not by the Central Government, but by the localities concerned. In pursuance of this policy, the officer in charge of District No. 2, Vigan, Ilocos Sur, has been instructed to arouse public opinion with regard to a system of coöperation between the Bureau of Forestry and the people in carrying on the work. It is hoped that next year certain proggress in this work will be shown.

The most urgent needs of the Ilocos project at present are:

1. The permanent employment of at least one nurseryman to take care of the nursery at Vigan.
2. Proper supplies and equipment for the project.
3. The establishment of a forest nursery at Laoag, Ilocos Norte.
4. Proper protection of the demonstration plots by the people of the municipalities concerned.
5. An additional man, at least a forest guard, to assist Ranger Francisco L. Rola.

The importance of reforestation is appreciated by the people of Ilocos, and inasmuch as the Ilocos Provinces are among the most devasted regions of the Islands, the Bureau should endeavor to push on the work as fast as practicable.

(*f*) *Zambales Reforestation.*—The planting in San Felipe, Zambales, was made on September 1 and 2, 1923, under the direct supervision of Ranger Francisco Rola.

The area planted was approximately one hectare. The soil is a deep sandy loam, although in some places there are big stones. The slope is moderate and the exposure is toward the west.

The planting was done rather late due to the fact that during the early part of the rainy season the weather was so bad that

Ranger Rola could not get any transportation from Manila to Zambales. The species planted were as follows:

Narra	40
Teak	150
Molave	2,500
Total	2,690

In planting the seedlings the "bare root method" with the use of iron bars was employed. The spacing between the molave plants was one by one meter while in the case of teak and narra, it was two by two meters.

During the planting there was not as much help obtained from the municipality as in the past years. Owing to the lack of understanding of the value of this work which still exists there was not as much help obtained from the municipality during the planting season as was to be desired. However, the ex-president, Mr. Macario Manglicmot, with the help of a few members of the municipal council, was able to secure voluntary laborers. In addition to this, the principal of the Elementary School and Mr. Francisco Cayaban, also a teacher, had some 20 pupils take part in the work. With this force, 2,690 seedlings were planted.

The nursery in San Felipe is the only one in the Province of Zambales. Unfortunately, during the year no seeds were sown on account of the lack of funds to employ a nurseryman. One Francisco Manglicmot deserves mention, as he was willing to render services without pay during last year and this year, and took care of the nursery which contained some 4,000 seedlings. The expense incurred in this planting was rather high, due to long travel on the part of the ranger in charge of the project.

At present, the most urgent need of the work in Zambales is the employment of a nurseryman to take care of the nursery for next year, so that seeds may be sown for planting in 1925. The work in Zambales has progressed steadily since it was inaugurated in 1918. The people have shown great interest in it, and the failure to raise seedlings for planting next year was due to the inability of the Bureau to fulfill its obligation as the result of lack of funds. However, should it be possible, direct sowing of seeds will be practiced next year.

(*g*) *Cebu Reforestation.*—There was no planting done during the year in the Talisay–Minglanilla Forest Reserve, on account of the lack of funds. However, the Bureau has employed a forest guard to patrol the area. An inspection was made in June, 1923, by the officer in charge of Reforestation Projects, for the purpose of studying the economic conditions of the squatters

living on the area, to be used as a basis for the formulation of a definite policy by the Bureau.

During the inspection it was found that the trees in the nursery were already large, some of them having diameters of about 25 centimeters. Light thinnings were made in this portion of the plantation. There was considerable improvement of the vegetation along the Cebu–Toledo road from Camp No. 2 to Camp No. 7. Many parang trees had obtained foothold on the area, but there were also new caiñgins on the cogonales. In the lower Paquigno-Cuanos Block, the lumbang was very thrifty, and in some places it had already completely covered the caiñgins.

The teak plantation near monument "F" in the Mananga Bulacao Block was in an exceptionally good condition. The largest tree on this area had a diameter of 23.04 centimeters.

The charcoal licensees were active in their operations. Most of them were cutting ipil-ipil trees between camp Nos. 3 and 4. The difficulty encountered by these small licensees was that some of the people on the upper part of the Mananga River, outside of the Reserve, were manufacturing charcoal and bringing the product to Cebu without paying forest charges. The result was that these charcoal burners could sell their products in Cebu at a lower price than the licensees.

During the inspection it was gratifying to note that the people were friendly, and it is believed that the Bureau can now continue the work in coöperation with them. The proposed development of a forest community is meeting the approval of the settlers.

(*h*) *Makiling Reforestation.*—During the year no new areas were planted in the Makiling National Botanic Garden, due to the limited number of caiñgineros as the result of the classification of a portion of the Calamba Estate Addition as agricultural land. With the limited amount of labor this year, the work consisted entirely of replanting and cleaning the areas (I, II, and III) reforested last year. The plan of work, organization of crews, and methods of planting followed those adopted last year.

(*i*) *Pangasinan Reforestation.*—The work in Pangasinan consisted of coöperation with the Hacienda Esperanza and the planting of the communal forest of Labrador. During the year large amounts of seeds, particularly of teak, narra, and cabonegro were sent to the Hacienda Esperanza for planting. The work started in 1922 was inspected by Ranger Rola on September 12, 1923. It was found during the inspection that a temporary nursery was established and seedlings of teak and narra were growing. In the selection of the nursery site particular at-

tention was not given to water supply and soil conditions. The result was that large number of the seeds sown did not germinate. Improper treatment of seeds also accounted for their failure to germinate.

It was also noted that 136 seedlings of narra and 932 of teak were set out in the plantations during the months of June and July. The "bare root method" with the use of mattock was employed in planting. The narra plants had 100 per cent success while the teak had 99 per cent. The former had an average height of about 75 centimeters and the latter from 40 centimeters to 1.2 meters.

The manager of the Hacienda plans to plant 100 hectares with pure teak and a similar area with other important tree species. The coöperation of the Bureau with this Hacienda in pushing its project is necessary, inasmuch as the work so far has been very successful.

On June 20 and 21, 1923, Ranger Juan Acenas of Dagupan Forest Station, Pangasinan, planted the communal forest of Labrador with ipil-ipil seed. There were 35 hectares planted. The laborers used were residents of Labrador, Pangasinan, who made clearings within and outside of the communal forest.

The plantation was inspected by the officer in charge of District No. 4 on November 27. During the inspection it was found that most of the ipil-ipil seedlings growing on the area were among shrubs and small trees, and only a few in open places. The failure of the seedlings to grow on the cogon areas was due to grazing by carabaos. Some of the seedlings had an average height of 15 centimeters. This office has taken steps to request the President of Labrador to protect the planted areas from being grazed upon by carabaos.

(*j*) *Salinas Reforestation.*—In the report of last year the planting of Salinas Forest Reserve, in Nueva Vizcaya, was mentioned. During the year there was no work done on account of the lack of funds. However, an inspection of the areas was made by Forester Zschokke and a plan of work was outlined.

(*k*) *Agno Reforestation.*—During the year the Government has not taken any definite action regarding the proposed reforestation of the Agno River Valley. Foresters Zschokke and Laraya mentioned the importance of the proposed project in reports submitted by them.

(*l*) *Arayat Reforestation.*—No planting was done on the Arayat Mountain this year on account of the lack of funds. All of the projects mentioned above are still unfinished, and they should be continued next year.

(*m*) *Corregidor Reforestation.*—No work was done in Corregidor this year. However there was a request by the Military authorities for the inspection of the areas where the batteries are located for the purpose of planting some trees, shrubs, vines, etc., which will serve as a protection from an observer in an airplane. Plans for this work have been made but no planting has yet been done.

(*b*) NURSERIES

A small portion of the old nursery in Hectare D has been used for the transplanting of some seedlings raised in the new nursery. Cuttings of ornamental plants were also headed in this nursery. The vacant places in the southern portion, caused by the removal of the ornamental plants, were planted last year with pine seedlings from Baguio.

The nursery on Hectare A, having an area of about 46 ares is fully occupied. During the early part of 1923, it was enclosed with wire fence. The soil in this nursery is heavy clay, but by mixing with it forest mold and charcoal powder it has been made to produce good planting stock. The nursery had supplied all the materials used in reforestation work on Mount Makiling and on the Forest School Campus, and in filling orders from outside. At the end of the year 1923 stock on hand in both nurseries comprised 65,931 seedlings of timber species, and 7,516 of ornamental species. Most of these were raised during the year. The total of the timber species this year is greater than that given last year, on account of the large number of seedlings left from the previous year. The total number of plants distributed is only one-fourth of those distributed in 1922. Considerable amounts of narra, molave, and malaruhat were again raised this year for Mount Makiling reforestation.

(*c*) SEED COLLECTION AND DISTRIBUTION

Approximately 1,611 liters of seeds were received during the year. Of these 1,603 were collected within the Philippine Islands and 8 liters from foreign countries. Over one-half of the total amount was collected by the personnel of this Office from the School of Forestry plantations.

At the end of the year, the total amount of seeds sown in the nursery was 394 liters, besides 2 liters sown in the Makiling National Botanic Garden. The latter was part of the Sandal wood seed recently received from India. The seeds of exotic species received were sown immediately in seed boxes and seed beds, but due to their poor conditions when received, the majority of them did not germinate. Among the species that failed to

germinate were *ceroxylon, andixolum, Dendrocalamus, sikkinensis, Grevilla robusta, I. pemanlata,* etc.

During the year approximately 1,124 liters of seeds were distributed from this Office. Of this amount 344 liters were sent to various places in the Philippine Islands, and 280 to foreign countries. This amount is considerably greater than that distributed last year. The plantations at the Forest School supplied most of this amount. At present, we have on hand 353 liters of seeds ready for sowing and distribution.

(*d*) ARBORETUM

The arboretum has been kept in good condition. Thirty-nine plants of various important species were planted, making now a total of 702 plants.

(*e*) PLANT ACCESSION

This year 325 plants were received from various sources as follows:

No. of plants	Name of plants	Condition	Sources
4	Sanque	Died	Calauang, Laguna.
24	Coniferous	Living	
9	Cinchona	Died	Baguio Nursery.
10	Eucalyptus	Living	
40	Eupatorium riparium	do	
6	Thuisa orientalis	do	
6	Salix mutlinervis	do	
17	Mulbery	do	College of Agriculture.
209	Hydnocarpus	do	Bureau of Agriculture.

The seedlings from Benguet were planted in the School of Forestry campus, the Hydnocarpus, in Hectare 2 B, and the mulberry in Hectare D. The majority of these plants are now doing well.

A total of 22,399 plants were distributed from our nursery, during the year. Of this amount, 16,432 were timber species, and 5,967 were ornamentals. The majority of the timber species were used in filling in bare spots in the reforested areas on Mount Makiling. The ornamental plants were sent to various individuals in Manila and to Military posts.

(*f*) PLANTATIONS

During the early part of this year, clearing and pruning in the lower plantation was done by the junior students and during the latter part of December the brushing in of 9 hectares was done by means of contract labor.

During the strong typhoon of 1923, 49 trees, amounting in volume to 6.98 cubic meters, in the School of Forestry plantation were blown down. In the improvement of the road leading to

the swimming pool, 20 trees representing 2.70 cubic meters were felled mostly in Hectare B, making a total decrease of 69 trees with a volume of 9.68 cubic meters.

Seedlings of various important species were set out in bare places in the different hectares on the School of Forestry plantation. These are shown in the following table:

Hectare	Scientific name	Common names	No. of plants
A	Carissa carandas		60
1–A	Cinamomum camphora		142
	Acaasia Confusa	Camphor	148
3–A	Calophyllum inophyllum	Palomaria de la Playa	170
4–A	Heritiera littoralis	Dungon-late	54
2–B	Hydnocarpus butchinsonii		219
	Hydnocarpus teysmaniana		169
	Hydnocarpus alcala		40
	Calophyllum inophyllum	Palomaria de la Playa	80
3–B	Intsia bejuga	Ipil	150
	Dipterocarpus sp	Apitong	37
4–B	Pterocarpus sp	Narra	473
C	Elaeis giniensis	African oil palm	3
4–C	Caryota cumingii	Pugahan	10
	Swietenia mahogany	Mahogany	120
	Hevea brasiliensis	Para rubber	56
	Terminalia comintana	Bingas	105
5–C	Intsia bejuga	Ipil	420
D, E, E	Morus alba	Mulberry	17
H, C, C i, F i	Notha phoebe	Malabunga	153
	Elaeis giniensis	African oil palm	9
	Caryota Comingii	Pugahan	16
	Total		2,951

The majority of these plants are now doing well.

Of the cinchona seedlings raised in the nursery in 1922 only 39 seedlings were obtained after the heavy attack of "Damping off" fungus. The 39 seedlings were planted near the second camp on Mount Makiling during the early part of September. About the middle of December there were only 10 seedlings found living. These living plants have an average height of 10 centimeters. The average height growth made during three months was 2 centimeters. These are still under observation.

Thirty-nine nipa plants were planted along the bank of Molawin Creek during the early part of the year. Lately it was found that all of them died due to the fact that they were unable to receive light.

(*g*) STUDIES

In connection with the administration of reforestation projects of the Bureau, the officer in charge has carried on his studies started last year on the behaviour of malaruhat under a dense stand of ipil-ipil. In a report submitted in the early part of the year, the following points were mentioned:

1. That malaruhat has relatively a high percentage of success when planted under a dense stand of ipil-ipil. Six months after planting, the per cent of living plants is 85.25.

2. That malaruhat is a hardy species for field planting.

3. That the planting of malaruhat with the use of dibble is feasible and successful. It undoudtedly would be a profitable method to use on a large scale.

4. That the healthy condition of 53.75 per cent of the number of seedlings planted seems to indicate that malaruhat can endure a certain degree of shade. It remains still however to ascertain how long and to what size or age does malaruhat will keep its tolerance under a dense canopy.

The work will be continued as long as valuable data can be obtained. The next measurement of the plot will be made on January 21, 1924. The progress of the work at that time will be compared with the observation so far noted.

In line with the above study, a new one was started on August 24, 1923. This was broadcasting the seed of malaruhat under a dense stand of ipil-ipil. The inspection of the plot will be made on August 24, 1924, and report will then be submitted.

7. MAKILING NATIONAL BOTANIC GARDEN

(*a*) ORDINARY LICENSES

There are no commercial timber licenses operating in the Makiling National Botanic Garden. At present there are only five minor forest product licenses and one permit in force in the Botanic Garden proper as follows:

Number of licenses operating	Product	Amount
1	Firewood	150 M.³
1	do	200 M.³
1	do	200 M.³
1	Charcoal	80 M.³
1	White earth	2,000 kilos.
1 (permit)	Land	40 ha.

(*b*) GRATUITOUS LICENSES

During the year, 91 gratuitous licenses were issued, 47 being for timber for personal use, and 44 for minor forest products. The total amount of timber granted under gratuitous licenses was 136.97 cubic meters of second, third, and fourth groups. One thousand seven hundred and thirty-four kilos of minor forest products consisting mainly of rattan, hingiw, kamagsa, orchids, moss, çabonegros, etc., were issued under gratuitous license.

(*c*) CALAMBA ESTATE

In Calamba Estate Addition to the Botanic Garden, there were four minor forest product licenses issued.

(*d*) CAIÑGIN PERMITS

During the year, 99 caiñgin permits were issued within the Makiling National Botanic Garden and 31 within the Calamba Estate Addition. The issuance of the permits is in connection with the reforestation project. Most of the caiñgin permits issued to squatters are renewals of the caiñgin areas granted last year. Few new contracts were granted this year on areas fitted for reforestation purposes.

THE WORK IN BAGUIO

PACDAL NURSERY

The inadequate number of nursery laborers at the disposal of the station made it imperative to concentrate all cultural work upon a limited area of the nursery, namely the seed and flower beds. Because of this, the greater portion of the nursery occupied by the larger transplants and the experimental plantation have received very little care and to those persons unacquainted with the labor shortage, the nursery and its surroundings have given a very poor impression. Still the evil results are only apparent because the larger plants have deeper root systems, and really suffer little from grass crowding.

The work with the available money and labor at hand had to consist mostly of maintenance, but in April of this year, it was made possible thru the work of the Director of Forestry, to secure student help from the Trinidad Agricultural School for about two weeks. All the nursery area was weeded and half of the area was plowed once, under this special arrangement.

It was also possible to secure 32 cubic meters of stable manure from Camp John Hay (also in exchange for plants from the nursery) which was used in fertilizing the seed beds. This was badly needed as the fertilizer from the sewer system and the ashes from the City Sanitary Camp are badly lacking in vegetable matter.

The 1924 planting is characterized by the importation of planting stock from the lowlands and from abroad, as it is proposed to plant fruit trees everywhere in the City and Parks. This was not done in the past, as the experience in other places with such planting did not favor it. But since the City Mayor recommended it strongly, a heavy order was placed for fruit plants and the same are now being set out as fast as conditions permit.

The flower seeds imported from abroad were sown partly during January and February of this year, and of these the sweet peas and dahlias were the most successful, lasting until the heavy rains destroyed them. The other portion of this shipment of seeds was sown in October and November, some of the plants flowering at Christmas time.

A portion of the nursery area will be reserved for camphor and quinine grown under an intensive system of cultivation, such as continuous weeding and frequent fertilizing. They have been tried in the past as forest crops but they failed to show creditably, due perhaps to the extreme poverty of the soil in this locality.

Camphor, which is difficult to raise from cuttings, was fairly successfully grown this year. Out of 5,000 cuttings planted we have now 859 plants growing in the nursery. Another attempt will be made during the next season to increase our stock of camphor to enable us to start planting on a larger scale. This is necessary as repeated importation of camphor seed from various sources have given no favorable results, probably because the seeds were not carefully gathered or were improperly stored.

Of cinchona, we have now 2,020 plants in the nursery, and most of these will be given away to lower localities for trial. It is proposed to give the Trinidad Agricultural School a big proportion of both of our camphor and cinchona stock, the soil there being richer and intensive cultivation being easier to accomplish with the equipment and labor facilities at their disposal.

Late this year the nursery was infected with field mice which feed upon the seeds of pine, coffee, and other plants, and in order to check their omnivorous appetite it is necessary that special seed beds covered with chicken wire with $\frac{1}{4}$-inch mesh be constructed. The use of cats is not advisable as they would trample down the seed beds in running after rodents. In this connection we have placed a requisition with the City for this kind of wire. It was suggested to try using for this purpose that roll of fence wire with a 6-inch mesh which we have at the nursery. Fortunately there are now some 11,000 pine seedlings for the next planting season, though we had hoped to raise some 100,000 more as soon as the wire net was secured in order to have the plants ready by June of this year. As it is, and until we get the wire, the pine seeds on hand can not be sown.

SALE OF PLANTS

In accordance with the policy of charging a reasonable price for nursery plants given to outsiders after the needs of the City of Baguio and of the Insular Government have been met, a price list was prepared covering for the time being only those species of which there is a great number at the nursery. The collection of charges for plants will be started as soon as the price list is approved and we are supplied with Government official receipts such as are used by treasurers and other Government receiver of money.

Nursery stock.—There are available for the planting season some 15,000 plants for City planting and 50,000 plants for reforestation, not counting 18,000 plants still too small to be planted out. In spite of the heavy drain from the nursery stock this year, there are still available for the next season the following:

Camphor	859
Coffee	455
Cinchona (quinine)	2,020
Benguet pine	11,000
Eucalyptus	5,753
Salix (basket willow)	825
Cupressus	1,899
Cryptomerias	1,322
Cypresses	5,448
Cannas	5,350
Goldenrod	6,000
Montose	5,000
Color shrubs from the lowlands besides many smaller lots of less than 500 plants each	3,366

Distribution.—During the early portion of the year a large number of plants was given out of the nursery to private parties, due to a misconstruction of our orders by the ranger in charge of the nursery, but soon this condition was remedied and we returned to our former policy of not giving any plants away unless they were no longer needed for reforestation or for the beautification of the City.

Altogether there were 20,451 plants removed from the nursery of which:

4,560 plants were given to the City of Baguio
9,711 plants given for reforestation
4,859 plants given to private parties
1,207 plants given to Camp John Hay and
114 plants given to public schools.

PLANTATION

The experimental plantation above the nursery has received small additions this year in the shape of a few specimens each of some 30 species. Altogether there are 3,519 plants under observation, comprising 120 species.

REFORESTATION

The reforestation work this year consisted in planting some 2,000 plants at the Trinidad Agricultural School and on the Stock Farm, besides 4,300 pines and eucalyptus on both sides of the Santo Tomas trail from Kilometers 6½ to 8, and 4,000 pines in the vicinity of the mill at Antamok.

The older plantation at Trinidad is well protected from fire and the new plantation at Antamok is also carefully protected, the company having spent ₱200 in cutting all the grass on the plantation. This was not done under our advice. As the area planted is enlarged, the fire protection should consist of fire-lanes 10 meters wide at intervals of 50 or 100 meters. No firewarden is needed, as the area is close to the mill, where laborers are available for firefighting in case of need. We are glad to report that Mr. Kettenback, Manager of the Antamok Mines, has given active coöperation in this matter of reforestation and has offered to furnish the nursery with pine seeds. Mr. Kettenback has also offered to pay ₱0.25 per sack for cones, but the forest guards report that just at this time no mature cones are found in any abundance.

The Santo Tomas trail plantation has suffered heavily from damage caused by cattle but the guard stakes have been replaced with heavier ones, calculated to stand the trampling of animals that are abundant in that locality.

Economic species.—Many species of fruit trees have been imported this year from the lowlands, most of which have been recommended by Mr. P. J. Wester, Horticulturist. Some of these have not succeeded in Baguio, but Mr. Wester hopes that with intensive cultural methods and plenty of fertilizing they can be made to fruit. The practicability of the plan is yet to be proven.

The old scheme was to plant bright-colored plants, and those having showy but not eatable fruits, as such plants can easily be left to themselves with the minimum of care and attention; but since receiving orders we are trying our best to make the new plan succeed at any cost.

Of the older introductions, the following are still under observation:

Castanea vulgaria (chestnut).
Castanea Koraiensis (chestnut).
Olea europea (olive).
Chrypsophyllum oliviforme (caimitillo).

The Araucaria bidwilli and chestnuts are a pronounced success as to growth, but we are still waiting for their fruits. A heavy order for Araucaria bidwilli was placed this year through the City of Baguio, but the seeds have not yet arrived.

The camphor is now being tested for the commercial value of its distillates and at the same time they are to be tried out in commercial plantations both here and at Trinidad, using more intensive methods of cultivation.

The cinchona is doing very well in the transplant beds and as soon as the seedlings reach the recommended size, they will be set out and accorded the same treatment as the camphor.

The basket willow (salix) which was imported three years ago has been successfully propagated and some 800 rooted plants are now ready for distribution in the wet localities in this neighborhood.

FORBES PARK

Early in the year, Ranger Oro began planting wild flower plants in Forbes Park, specially in the open and moist places. He also opened up the foot trails for the Park users. The development plan for both the first and second portions of Forbes Park was completed, and only needed to be carried out, but towards May there was a proposition to make a golf course in Forbes Park No. 1. For this reason, all previous plans for future development had to be suspended. However, the suggestion of the Director of Forestry to create a Park-like effect where it is possible, that is, alternation of lawns and groups of large trees, is being carried out. There is a big lawn near the Forest Station which breaks up the monotony of the sapling and pole stands so general in the Park, and which offers an opportunity for growing valuable and interesting species near the edge of the lawn where they can receive plenty of light, and at the same time be under the eyes of the office force and forest guards.

Another small lawn is being opened halfway between Teachers' Camp and the Foresters' cottage where more benches will be placed for the use of picnickers. "Picnic Grove" is frequently used by those wanting to spend a whole day in the Park, and if other attractions such as Children's playgrounds,

quiet retreats, shrines, and a zoölogical enclosure are made available, the Park will undoubtedly be one of the centers of attraction in the City.

For the development of an effect of retirement or seclusion, the Park has been screened from the houses and drives, by the planting of hedges which are now getting well established and are beginning to fulfill their purposes.

As reported last year, several thousand plants were set out in the Park, but they are in great need of manuring, as the soil is extremely poor in character. The manure secured from Camp John Hay was all used in the nursery, so the Park plants are still untreated. Unless these plants can be fertilized and given same attention they cannot develop fast and the effect to the eye as planned for will not work out for several years to come.

Forbes Park from all appearances is bound to become the real Park for Baguio. Burnham Park will be used for races and athletics, but Forbes Park should be a nature Park where one can find himself in the heart of a pine forest within half an hour's walk from anywhere in Baguio.

COÖPERATION WITH THE CITY OF BAGUIO

The District Office gave much more time this year to cooperating with the City of Baguio, and on the other hand, the City appropriated nearly ₱10,000 as against ₱2,000 in the year when the present City forester took charge of City beautification. Not all the above sum was however placed at the disposal of the City forester for the above purpose, as a portion of this allotment was used by the City Engineer for other projects.

Following the desire of the City Mayor, the previous policy had to be altered and we have now imported and planted around the City fruit trees and ornamentals from the lowlands, of the species recommended by Mr. P. J. Wester, Horticulturist of the Bureau of Agriculture. We are not sure that many of these species will grow successfully here, but we are giving them plenty of attention, hoping that they will. Another innovation is the placing of letters, shields, and other geometrical designs in various places in the City. This was never done before because these things are shunned by the best landscape authorities for very good reasons, one of which is the impression made of a primitive or rudimentary taste on the part of the designer which has a cheapening effect on the rest of the design.

We have been able to do more color planting at vantage points than in previous years and we mean to add more each year to vary as much as possible the monotony of the greens and browns so prevalent in Baguio.

Burnham Park is still in a poor condition because the groups of shrubs, totalling 1,092 plants, planted over a year ago on the Kisad side and which is to serve as a background for the Lake have not yet begun to show up. Rows of fern trees were planted near the water's edge on 4 sides of the lake besides rows of eucalyptus on the north and south sides.

Both Wright Park and Mansion House were given attention during the year. Cypresses that can be trimmed into balls or fancy shapes were planted on both places to replace some of the older shrubs. The Wright Park front approach was given additional groups of color plants for variety and contract.

The base of the new Central School was also planted with low-growing bright-colored ornamentals in order to soften the harsh junction of the vertical walls of the building with the horizontal surface of the ground.

The concrete posts in the city have been made less conspicuous by planting vines at their base and placing wires that would enable the vines to climb up and clothe the posts in green.

Fires.—Comparatively fewer fires occurred this year, and our fire-fighting squad was sufficient to put them out.

Towards the month of May, Forester Gillis was especially detailed to study the fire situation and his recommendations are embodied in his report.

Arrangements were made whereby our Fire lookout was transferred to the Dominican hill, and that point is now connected with the telephone system.

It was also agreed by the City Mayor to give to this Office the use of the city fire-truck to transport a greater number of men when they are needed, and also to permit the use of any available Government laborers for fire-fighting.

There were only nine fires of any size this year as compared with 41 of last year. Only six hectares of land were burned over and about 600 seedlings killed. This great decrease is partly due to the short dry season and the humid condition of the atmosphere during the fire period and also to the burning of the fire traps during the previous dry season. However, educational propaganda and warnings are being constantly used and these, coupled with systematic patrol-work, are expected to keep fires reduced to a low minimum.

Forest conservation.—Owing to the insistence of this Office upon the reduction of the annual cut from the Baguio Forests and the hearty concurrence of the city officials, the cut has been reduced appreciably every year, this year's firewood consumption being only 9,000 cubic meters.

This, with the stationary amount of lumber consumed in the last two years, and with the very few fires occurring this year, makes it an exceptionally good year as regards forest conservation, and if the record only be kept up in 1924, it will be a very encouraging sign of progress in our endeavors to reduce the drain from the forest and making up for the extravagance or spoliation of the past.

Without the steadying influence of the Bureau of Forestry in Baguio, even the very ornamental pines adorning the parks and drives of the city will be in continuous danger of destruction and conversion into firewood, being at the mercy of the untrained whims of "capataces" who cannot see beyond the firewood value of a tree, or their most immediate need, official or personal. The work of the Bureau in Baguio has now reached such a point that not a branch, seedling, or sapling is cut in the city without the Bureau's knowledge, and even private owners have realized this beneficent work to the extent that advice is invariably sought before felling any trees on their private grounds. Now, to throw away all this gain with a wave of the hand, is both untimely and inadvisable.

STUDIES

Growth of Benguet pine.—The growth plots in Forbes Park were carefully checked this year and numbered tin-tags placed on each tree under observation, as the measurement at 5 year intervals may be difficult to repeat unless the trees are well marked.

Plant survey.—Early in the year, Forester S. Laraya and Ranger Oro made a survey of the plants that are growing successfully in the gardens, road, and parks of Baguio, with a view to concentrating the work on the most successful ones. This plant survey together with the list submitted by Mr. Wester of the Bureau of Agriculture, formed the basis for the selection of plants which were imported for city planting.

Turpentine.—Further observations were made on the rate of flow of turpentine from various sized trees, giving different exposures for the faces and using the standard depths and heights of cutting as practiced in America. A sufficient quantity of pine resin was sent to the Bureau of Science for anal-

ysis of its commercial value, but until this date no report of the results obtained has been received.

Camphor.—Late in the year, the Director of Forestry made the necessary arrangements for a coöperative experiment between the Bureau of Forestry and the Bureau of Science. Doctor Wells of the latter Bureau was detailed to this district, and after looking into the possibilities of this coöperative arrangement, recommended that the Bureau of Education be included, as it is advisable to grow camphor in the richer soil of Trinidad and under intensive cultivation. A distillery will be installed in Baguio to test the commercial value of the distillates of the locally raised camphor.

SCHOOL OF FORESTRY

I. ENROLLMENT

The School reopened on January 8, 1923, with an enrollment of 23 juniors and 24 seniors, four of these (1 junior and 3 seniors) being pensionados of the British North Borneo Government.

During the year two students have dropped from the 1925 class owing to poor records, particularly in technical forestry subjects, and they were encouraged to take up other lines of work for which they are better fitted.

The students selected to comprise the class of 1925 began work on April 9. Besides the twenty-three regular pensionados, one student was permitted to take botany during the summer as a special student, and two pensionados for the British North Borneo Government were enrolled.

II. COMMENCEMENT

The seniors completed the ranger's course in March, and 24 members of the class received their Diplomas on the Commencement Day, March 27, 1923. The Director of the Bureau of Supply, Mr. Miguel Cuaderno delivered the commencement address dwelling at length on the business or commercial aspect of forestry in the Philippines. Forester Felix Franco of the Bureau of Forestry took part in the program of the day as a representative of the School of Forestry Alumni. The presentation of the Diplomas was made by Mr. Arthur F. Fischer, Dean of the School of Forestry and Director of the Bureau of Forestry.

The following were the honor men:

Medalist	Ricardo Arafiles.
First honor man	Zoilo Sambrano.
Second honor man	Robert Cortez.

On March 26, the class day program was rendered under the molave grove in front of the students' quarters. This consisted of speeches by representatives of the faculty, seniors and juniors, reading of the class will, class history, and planting of the class tree. A big bonfire followed in the evening. All sorts of primitive tribal dances were given before a large audience.

III. FACULTY

The changes that have occurred in the personnel are the transfer of Prof. B. W. Fullington to the College of Liberal Arts in Manila and the appointment of Prof. Clarence Neff in his place. Instructor Nano has been transferred to Manila and Assistant Rabaya has taken over the work in Wood Technology, together with the duties of Special Disbursing Officer, while Mr. Simplicio Beltran has been detailed to take over the instruction in Spanish.

Instructor Carlos Sulit has been sent as a pensionado to the United States to take further work in forestry at Yale Forest School.

Two members of the staff have been granted vacation leave during the year but the leave was so arranged that only one was away at a time. These members were Prof. Harold Cuzner who was granted leave to visit Japan to study the cultivation of bamboo and the Japanese method of making charcoal, and Forester O. W. Pflueger who was granted leave with permission to visit the States.

IV. INSTRUCTION

With the exception of the reconnaissance trip to Port Lebak in Mindanao by the Classes of 1923 and 1924, all the work in instruction has been carried on at the School as in previous years. The reconnaissance trip was under the direct supervision of Forester O. W. Pflueger with Instructor Carlos Sulit and Ranger M. Sulit aiding particularly in timber estimates, and Prof. L. R. Salvoza in charge of the running of base lines and general engineering work.

Due to the time occupied by military drill and physical training, the work given in woodsmanship has suffered but much of this will be given during the Christmas vacation.

The course in Botany was given to the new students during the period from April 2 to June 2, 1923. Instructor Jose F. Nano was in charge of the instruction as well as of the work of the Division of Investigation. Instructor Felipe Salvoza and Assistant Andres Lemos assisted in this course.

The school has been fortunate in that the students have had a chance to listen to informal talks by several distinguished visitors, among whom were General McCoy and Col. Langhorn.

Various lectures were delivered before the student body by Dean Arthur F. Fischer and before the class in wood technology by Forester Luis J. Reyes.

V. IMPROVEMENT

1. A shed for the storing of bamboo and nipa, which is necessarily kept on hand for the repair of student quarters and the district offices, was built.

2. The nursery has been fenced with page fencing above which are two strands of barbed wire. This was rendered necessary on account of the disappearance of many of the plants at night and during holidays.

3. The road has been resurfaced from the old mess to the School of Forestry. The heavy rains had removed much of the screenings leaving only the coarse rock, and in some places ruts were beginning to develop.

A new road starting from the School of Forestry and extending to the kilns has been laid out and grading has commenced. It is intended to extend this road across the river toward Camp Eldridge, following contours as nearly as possible. This will enable us to bring in materials from that district and also to supervise the planting in those areas more thoroughly.

4. Trails have been brushed out and are in good shape; particularly those extending along the Molawin.

5. Care has been taken to make all repairs necessary to keep the buildings of the School and district from deterioration.

A kitchen has been added to the second faculty house in Hectare C, and a small kitchen has been added to the district building.

VI. ALUMNI

The following table give interesting information concerning the Alumni of this school.

TABLE I.—*Forest school alumni with degrees who are graduates of the University of the Philippines and various universities of the United States up to December 31, 1923*

Of the class (ranger course) (F. S., U. P.)	B. S.	B. S. F.	B. S. F. and M. S. F. or M. F.	Total
1912	.....	1	2	3
1913	1	1	2	4
1914	.....	1	1	2
1915	1	.....	1	2
1916	.....	.....	.....	.....
1917	.....	1	.....	1
Total	2	4	6	12

TABLE II.—*Vocations of forest school graduates up to August 31, 1923*

Vocations	Class of—													Per cent	Remarks
	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	Total		
														Per cent	
Bureau of Forestry	9	15	15	7	11	13	14	16	17	15	23	21	176	65.67	66
Other Bureaus, Philippine Islands		2	4	3	1				1				11	4.10	4
Officers, United States Army					1	1							2	.75	1
Officers, Philippine Constabulary	1	4	1										6	2.24	2
Borneo forest service			2								2	3	7	2.61	3
Chinese forest service			1	1	3		1		2				8	2.98	3
Guam forest service					2								2	.75	1
Lumber business	1	2	3	1	1	1		1	1				11	4.10	4
Lawyers		1		1									2	.75	1
Students (Philippine Islands)		1				1	1						3	1.15	1
Students (United States)	1		1	3	1		1	2					9	3.35	3
Occupation unknown	2	1	2	2	1	2	1						11	4.10	4
Deceased	1	1	2				1	1					6	2.23	2
Other business	2	2	1	2	3	3	1						14	5.22	5
Total	17	29	32	20	24	21	20	20	21	15	25	24	268	100	100

VII. DEGREE COURSE

The degree course was opened in June with 4 students taking full work and 7 students taking part of the courses. The students taking part time work in the degree course are acting as assistants or instructors in the Ranger course. All of the work of the first year of the degree course, with the exception of English III and IV, Forest Economics, Forest Policy, and Mathematics III is given at the College of Agriculture.

One difficulty encountered is the necessity of various students being called out to act as witnesses in various land cases. This tends to throw them behind in their work and should be avoided as much a possible.

Next year considerable difficulty will be encountered in giving the work for the advanced course, unless the positions asked for in the budget of the University are allowed.

Another difficulty that we are encountering is the lack of sufficient class rooms. Only two class rooms are available for all classes, i. e. both in the Ranger course and the advanced course. These are occupied all day by the Juniors and Seniors of the Ranger course, so it has been necessary to hold the classes of the students of the advanced course in the offices. As there were only a few students in the advanced course this year, this difficulty has not been so great; but next year it will be worse and in the third year, when we will have more classes, and when more of the work will be given here, there will be an almost impossible situation. It is therfore requested that strong efforts be made to procure a new building to provide for the necessary class rooms and laboratory space. It will be noted that there is no laboratory room at present, and no place for herbarium or museum.

One student was graduated from the degree course during this year.

DIVISION OF SAWMILLS AND UTILIZATION

PERSONNEL

With a general improvement in the lumber market, there has been a sharp increase in the activities of the Division while the small increase in the personnel of the Division practically did not become available until October or later, when much of the increased work had already been performed. Through resignations and transfers to other Divisions for needs of the service, the Division of Sawmills and Utilization lost 1 lumber inspector, 1 senior ranger, 2 rangers, and 5 guard scalers,

while additions to the force consisted of 3 foresters temporarily assigned on their return from the United States as pensionados, 1 forest supervisor, one ranger reinstated in the Bureau and eight new men assigned from the 1923 Forest School Class.

With these changes in personnel, the Division force consisted at the close of the year of 1 Chief of Division, 6 foresters, 1 forest supevrisor, 40 rangers, 36 guard scalers, three clerks, and 15 concession guards, a total of 99 men as compared with 88 men at the close of 1922.

This increase did not, however, as indicated above, constitute an effective increase in the working personnel of the Division during the year, as the majority of the men were not available for regular work until the last two to three months of the year.

Cost figures for the work performed by the Division have so far been worked up for the first nine months of the year and are given in the following table with the total cost for 1922 for comparison:

Division of Sawmills and Utilization

[Cost and revenue for 1923]

District	Log scale		Tie and lumber inspection		Total number of days [1]		Cost				Revenue per cubic meter	Cost per day	Revenue per day
	Cubic meter	Forest charges	Cubic meter	Fees	Field	Office	Salary	Expenses	Total	Per cubic meter			
I	3,551.94	₱5,303.96			88	39	₱226.50	₱67.53	₱294.03	₱0.083	₱1.49	₱2.32	₱41.76
II													
III	9,901.58	9,911.70			170¾	129¾	508.74	134.45	643.19	.065	1.00	2.11	33.01
IV													
V	53,104.99	52,484.18			429¼	923¾	2,531.87	169.76	2,701.63	.051	.99	2.00	38.79
VI	16,659.80	17,061.55	900.00	190.69	657¼	361¾	1,826.28	439.03	2,265.31	.129	.98	2.22	16.95
VII	194,820.20	134,378.77	418.55	266.20	1,482½	1,906¼	7,067.34	904.45	7,971.79	.041	.69	2.35	39.69
VIII	78,561.96	82,730.45	203.62	215.22	1,459¼	2,623⅓	9,280.24	1,493.37	10,773.61	.137	1.05	2.64	20.25
IX	1,415.50	2,449.12			38¾	106¾	442.90	.25	443.15	.313	1.73	3.42	16.84
X	6,209.75	6,402.27			153	152½	472.64	69.52	542.16	.087	1.03	1.78	21.00
XI	55,856.71	53,549.32			961½	781¼	3,516.60	30.49	3,547.09	.064	.96	2.04	30.70
XII													
XIII	61,443.31	49,931.63			460½	523	2,102.18	117.80	2,219.98	.036	.81	2.26	50.80
Total	481,525.74	414,202.95	1,522.17	672.11	5,900¾	7,547¾	27,975.29	3,420.65	31,401.94	.065	.86	2.34	30.80
Manila Office:													
Grading instruction					595	132	2,924.20	1,393.21	4,327.41	.009		5.95	
Scaling instruction					467½	70¾	1,747.58	583.20	2,330.78	.005		4.33	
Utilization Section			7,508.83	4,173.39	322¼	1,531¼	7,277.65	531.71	7,809.36	.016		4.22	
Supervision					259¼	1,483½	12,360.89	1,275.21	13,636.10	.028		7.80	
Total	481,525.74	414,202.95	7,508.83	4,173.39	1,643¾	3,217¼	24,320.32	3,783.33	28,103.65	.057		5.78	
Grand total	481,525.74	414,202.95	9,031.00	4,845.40	7,544½	10,765	52,295.61	7,209.98	59,505.59	.121	.86	3.25	22.89
Total (1922)	407,738.75	364,862.31	9,304.02	2,690.02			43,390.52	6,884.00	50,274.52	.121	.895		

[1] Including Sundays, holidays, and leave.

On a day basis the total cost of operation of the Division for a total of some 11,500 working days from January 1 to September 30, was ₱3.68 while the gross revenue was ₱26.70 or a net revenue of ₱23.02 per day per man.

SCALING

The need for a larger scaling and supervisory personnel has been regularly discussed in previous reports and has only been emphasized during the past year by the increased activity of lumber companies and the still greater activity in prospect for the coming year. The following table showing the log scale, lumber production and sales during the past six years for the mill at which all or a major portion of the logs are scaled by forest officers gives an idea of the rapid increase of this work.

The figures for 1923 are partially complete to November 30, as many of the mills are still unreported for November and December:

Year	Number of mills	Log scale	Forest charges	Mill tally	Lumber sales
		Cu. m.		*Cu. m.*	*Cu. m.*
1918	16	241,302.28	₱182,472 60	167,360.17	155,075.73
1919	19	288,340.06	245,524 11	203,221.24	193,455.44
1920	21	314,538.17	270,692 01	223,653.06	222,317.47
1921	26	368,971.84	336,464.94	234,857.65	200,573.41
1922	29	403,786.98	351,614.21	262,389.67	268,883.78
1923	30	476.622.88	409,097.58	318,765.78	318,929.00

Of the mills included under 1922, one suspended operations during the whole of 1923 and one closed down in August through failure of the Company. Scalers were sent to three new mills during the middle and latter part of 1923, only two of which could be included in the above table, the report of the third coming too late in the year to be included in the statistics of scale, tally, etc. Thus, while there were some 49 mills working on Government land during the year and 11 mills purchasing their logs from other licensees, Government scalers were stationed at only 24 mills to scale all logs and were sufficiently close to 7 others to scale most of their logs, while the remainder were dependent on the licensees measurement with such irregular checking by forest officers as could be made. In other words timber goes from the public forest to some 29 mills cutting some 35,000 to 40,000 cubic meters per annum, with little or no more than the purchasers statement of the volume for the collection of the charges due the Government.

The chief need for improvement in scaling work is an increase in the personnel and pay of the guard scaler force. While it does not require the full training that is given a ranger, scaling does require special training. This training can be given to men of common school education so that they can be employed at lower salaries than the rangers for performing the routine work, relieving the latter for other classes of forestry work. The salaries are however too low, the two highest paid men receiving only ₱60 per month after seven years' service, and others ranging from ₱30 to ₱50, though they are responsible for the measurement of ₱1,000 to ₱3,000 worth of timber each month besides other work performed in connection with the administration of the license area.

With the amount of work they are called on to perform in comparison with their salaries, there is a constant turn-over in the employment of these men, whose training frequently enables them to secure better paid work with the lumber companies, thus reducing the efficiency of the Bureau personnel because of the necessity of constantly employing and training new men.

GRADING

With the resignation of the lumber inspector in March, the further training of official Government graders has had to be abandoned once more, though with the shortage of personnel and expense funds, it is doubtful whether a new crew could have been put in the field with the completion of instruction of the old crew. With the completion of training of the last grading crew in March, there are now nine men in the Bureau capable of doing lumber grading work, though with the demands for their services in other lines of work they cannot always be called on promptly for grading.

The total cost of training the six men released in March was ₱12,945 in salaries, subsistence and travel expenses of the men and the instructor, or ₱2,157.50 per man. In return for this outlay, there is due or paid ₱5,800 for inspections made during 1923 only, of which the cost in time and travel expenses of the graders amounted to some ₱2,000, leaving a net revenue of some ₱3,800 for the year.

Thus in only partially providing for the lumber inspection service which is constantly growing in demand, the Bureau has been reimbursed 30 per cent of its investment during the first year.

Forty-five requests for inspection of lumber and ties have been received and complied with during the year, involving

inspection of some 3,000,000 board feet of lumber and 85,000 cubic feet of ties.

Some difficulty has arisen during the latter part of the year through the ruling of the Insular Auditor that the Director of Forestry or his subordinate immediately responsible shall be held liable for any credit extended in the performance of services for which a charge is made.

This ruling places on the officer concerned a responsibility and a hazard which this office considers unjustifiable. The training of lumber graders and the furnishing of this service were undertaken by the Bureau of Forestry, not only for the benefit of Philippine lumbermen who are charged accordingly for services rendered, but for the benefit of the Government itself whose ownership of the forests and whose revenue from the sale of the timber give it a direct interest in seeing that the good name of its products are protected by a guarantee of the quality and quantity of product sold, which guarantee can be secured only by proper grading. This office is not equipped with a credit department, or otherwise always in a position to determine the financial responsibility of persons requesting services for which a charge is made. Nor is it often possible to determine in advance what the full charge will be in order to specify the amount to be paid in advance of performing the work. Thus the Auditor's ruling tends to either place a heavy financial responsibility on the Bureau Director and officer immediately concerned or an interference with extension of services for which it is to the direct benefit of the Government that every facility be given.

LUMBERING

There has been a general increase in the activity of the mills previously operating, in spite of the failure of one company in August.

The Locanin Plantation Co. operating a small mill in Bataan was shut down during the whole year, while the Flecha Point Lumber Co. was finally closed in August through poor management and indebtedness.

A reduction in the amount sawn from January to November, 1923, as compared with 1922 is also noted for five other small operators, but the remaining mills report increases of from 200,000 to 8,000,000 board feet while the total increase for the mills reported in the above table amounts to some 13,000,000 board feet.

New mills were installed and started in operation by the *Aserradora Mecánica de Gandia* at Oton, Palawan, in April,

and the Milbuk Timber Company at Milbuk, Cotabato, in June while small mills were purchased for installation in Camarines Sur and Catanduanes Island. The Asia Lumber Company, formerly operating on private land, started cutting Government timber about August, while the mill formerly operated by Maximino de los Reyes in Bataan has been taken over by the Abra de Ilog Sawmill Co. and installed at Abra de Ilog, Mindoro, for operation in connection with a license for Government timber.

Considerable improvement work has been done in milling, logging, or organization by the Insular Lumber Company, Negros–Philippine Lumber Co., Basilan Lumber Company and Port Banga Lumber Company and with a general firmer tone in the lumber market, there has been considerable renewed interest on the part of prospective investors in sawmill operations which should bring a still greater increase in production during the coming year.

MARKETS

From January 1 to November 30, the total sales of 32 mills from which reports have been received amounted to 123,712,000 board feet, while shipments to foreign countries amounted to 31,946,000 board feet, leaving a total of 91,766,000 board feet sold in the local markets, as compared with total sales of 115,643,000 board feet, exports of 18,285,000 board feet, and local sales of 97,358,000 board feet during the whole of 1922. As the exports for December, 1923, amount to 5,000,000 board feet, the total deliveries to local markets for 1923 remain at practically the same figure as for 1922, which with the natural increase in local demand through improved economic conditions has relieved the overloaded condition of the local markets, and produced a consequent tendency of prices to increase.

Following is a tabular statement showing the comparative sales by species, and ports to which timber was shipped in 1922 and 1923. As Manila is a common trans-shipping point for much of the timber exported, much of the lumber exported during the year appears in these tables as shipped to Manila instead of to the country to which it was finally sent.

Class B and C Mills—Lumber shipments by 31 lumber companies, January 1 to December 31, 1922

Destination	Red lauan and tañgile	White lauan	Apitong	Guijo	Mangga-chapui	Lumbayau	Yakal	Palosa-pis	Miscellaneous				Total
									First group	Second group	Third group	Fourth group	
	Bd. feet	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*
United States	3,787,349	1,246,427	1,377,955	308,569	.....	.....	.....	.....	1,211	.....	2,007	158,264	6,881,782
England	50,769	45,462	73,044	.....	.....	16,224	.....	.....	.....	.....	.....	.....	185,499
Australia	296,979	226,157	3,458	87	.....	10,227	72	.....	.....	.....	.....	105,277	642,257
Africa	3,979	4,784	.....	.....	.....	5,046	.....	.....	.....	.....	.....	.....	13,809
Shanghai	1,092,437	2,004,327	434,821	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,531,585
Hongkong	1,749,110	89,102	1,581,550	4,398	.....	.....	.....	7,006	182	.....	.....	.....	3,431,348
Japan	12,468	21,745	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34,213
Singapore	4,853	586	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,439
Manila	20,859,586	22,194,295	17,588,540	2,488,410	372,935	1,286,639	2,924,383	276,609	587,789	193,713	392,369	2,219,828	71,385,096
Luzon ports	883,269	1,228,980	6,132,668	437,079	4,633	.....	181,179	401,866	714,216	501,183	1,165,092	1,596,940	13,247,105
Cebu	952,839	1,042,867	1,056,964	84,006	12,111	362,928	62,987	96	5,693	.....	1,425	255,167	3,837,083
Iloilo	706,243	1,390,242	167,424	94,217	11,424	19,671	223,956	11,216	7,239	25,193	21,726	.....	2,678,551
Visayan ports	2,386,962	1,515,818	1,035,456	26,380	270	96,346	157,381	.....	6,224	10,920	63,524	324	5,299,605
Zamboanga	143,750	187,697	221,258	140,918	24,415	732,081	143,858	.....	49,809	12,907	37,699	206,517	1,900,909
Davao	9,955	10,282	.....	.....	.....	2,938	.....	.....	.....	.....	3,805	1,333	28,313
Mindanao and Sulu Ports	502,423	767,628	516,852	95,001	3,043	92,745	59,004	.....	108,505	16,605	48,856	526,471	2,737,133
Total	33,442,971	31,976,399	30,189,990	3,679,065	428,831	2,624,845	3,752,820	696,793	1,480,868	760,521	1,736,503	5,070,121	115,839,727
Mill tally	33,770,489	28,614,771	28,029,254	2,843,637	488,154	2,294,749	3,064,596	968,933	1,660,346	1,188,558	3,379,736	1,802,562	108,105,785

Class B and C Mills—Lumber shipments by 31 lumber companies, January 1 to December 31, 1923

Destination	Red lauan and tañgile	White lauan	Apitong	Guijo	Mangga-chapui	Lumbayau	Yakal	Palosapis	Miscellaneous				Total
									First group	Second group	Third group	Fourth group	
	Bd. feet	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*	*Bd. feet*
United States	10,272,086	8,060,353	3,014,761	561,533	1,686	3,379	.....	.....	.....	.....	60,416	749,681	22,723,895
England	990,756	482,259	607,428	160,868	.....	56,223	.....	.....	3,445	.....	1,632	24,048	2,326,659
Australia	78,782	252,591	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	331,373
Shanghai	886,034	672,477	354,948	.....	.....	.....	.....	.....	.....	.....	.....	92,739	2,006,198
Hongkong	.....	.....	37,032	17,544	.....	.....	.....	.....	.....	.....	4,380	.....	58,956
Japan	161,407	651,873	868,660	.....	.....	5,328	.....	.....	.....	.....	.....	245,815	1,933,083
Manila	13,950,586	13,377,624	12,815,544	2,722,812	308,613	1,762,179	2,535,694	161,089	789,326	227,383	674,082	4,700,466	54,025,398
Luzon ports	910,059	3,931,007	5,696,669	608,511	16,195	.....	509,657	196,267	544,068	162,200	2,411,571	1,647,638	16,633,842
Cebu	751,172	1,007,831	1,325,304	70,047	2,417	492,462	67,319	.....	8,052	.....	10,679	153,954	3,889,237
Iloilo	706,425	1,188,384	100,042	17,830	553	763	36,332	.....	.....	.....	6,743	49	2,057,121
Visayan ports	9,815,180	5,988,098	1,990,517	16,719	162	67,401	165,349	153	62,075	9,075	26,489	235,818	18,377,036
Zamboanga	169,661	445,314	265,655	149,299	9,685	430,179	64,420	.....	2,220	5,020	28,387	233,981	1,803,821
Davao	96,536	6,466	10,227	33,829	.....	47,609	12,766	.....	351	852	6,443	16,882	231,961
Mindanao and Sulu ports	884,355	1,165,600	507,606	64,773	22,293	158,773	95,847	.....	16,882	21,263	84,633	225,849	3,247,874
Unclassified ports	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,945,126	.....	6,945,126
Total	39,673,039	37,229,877	27,594,393	4,423,765	361,604	3,024,296	3,487,384	357,509	1,426,419	425,793	10,260,581	8,326,920	136,591,580
Mill tally	40,967,553	39,702,617	29,080,416	5,198,285	419,657	2,603,453	2,620,241	1,087,484	2,047,537	833,910	6,480,233	5,263,852	136,305,238

FOREIGN MARKETS

The work of this Bureau and certain of the progressive lumbermen in encouraging the development of an export trade, the need for which was especially felt during the depressed and glutted condition of the local market in 1921 and 1922, brought very marked results during the past year, when a total of 36,950,000 board feet of lumber and timber valued at ₱3,058,000 was exported, as compared with 18,285,000 board feet valued at ₱1,668,000 during 1922,—an increase of 102 per cent in volume and 83 per cent in valüe. The apparent decrease in unit value of the shipments is due to the larger percentage of the lower priced woods, which form the largest available supply of woods suitable for export;—the shipments of lauans having increased from 58 per cent to 69 per cent of the total exports.

The greatest increase in volume of shipments went to the United States, while Japan, the United Kingdom, and China all show marked increases. While 80 per cent of the shipments to Japan were made during the last four months of the year, or in response to the demand created by the great earthquake, there was nevertheless a growing interest in and demand for Philippine lumber as indicated by the fact that previous to the earthquake, exports to that country had more than tripled the total shipments for 1922, 831,000 board feet having been shipped from January 1 to August 31, 1923, as compared with 283,000 board feet during the whole of 1922.

The setback suffered by the Australian market through the campaign started against Philippine lumber in that country prevented any material increase in shipments during 1923, but the fact that Philippine lumber is in demand in that country is clearly illustrated by the fact that there was a slight gain of some 160,000 board feet in the amount exported and that orders and shipments are continuing with apparently increasing frequency.

The following tables show the comparison of exports and imports of lumber and timber as recorded by the Bureau of Customs during the past four years:

Lumber and timber exported from the Philippine Islands

Species	1923 (January to December)			1922 (January to December)			1921 (January to December)			1920 (January to December)		
	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value
United States:												
Narra timber	2	848	₱150				106	44,944	₱6,450			
Miscellaneous timber							18	7,632	1,101			
Narra lumber	2	848	528	(?)		₱80						
Tañgile lumber	6,447	2,733,528	274,548	4,340	1,840,160	220,450	1,898	804,752	150,663	6,875	2,915,000	₱557,388
Almon lumber	1,661	704,264	61,970	643	272,632	27,226	2,352	997,248	124,843	1,892	802,208	111,871
Lauan lumber	31,149	13,207,176	1,120,218	12,039	5,104,536	450,105	4,576	1,940,224	438,892	10,014	4,245,936	446,879
Guijo lumber	1,593	675,432	80,713	304	128,896	14,650						
Apitong lumber	5,011	2,124,664	155,353	1,701	721,224	56,532						
Miscellaneous lumber	561	237,864	25,606	213	90,312	9,134	400	169,600	21,201	43	18,232	3,077
Total	46,424	19,684,624	1,719,086	19,240	8,157,760	778,177	9,350	3,964,400	743,150	18,824	7,981,376	1,119,221
Hongkong:												
Guijo timber	11	4,664	213									
Apitong timber	71	30,104	1,351									
Miscellaneous timber	328	139,072	6,308	23	9,752	2,443				48	20,352	1,000
Narra lumber	1	424	65	1	424	163						
Almon lumber				287	121,688	10,000	40	16,960	1,865	88	37,312	2,436
Lauan lumber				218	92,432	7,939	158	66,992	6,281	501	212,424	19,169
Guijo lumber				150	63,600	10,621						
Apitong lumber	1,237	524,488	39,596	2,548	1,080,352	71,892						
Miscellaneous lumber	65	27,560	12,896	452	191,648	33,850	2,214	938,736	87,388	416	176,384	37,324
Total	1,713	726,312	60,429	3,679	1,559,896	136,908	2,412	1,022,688	95,534	1,053	446,472	59,929
China:												
Narra timber				(?)		18						
Guijo timber				29	12,296	2,699						
Tañgile timber				9	3,816	550						
Miscellaneous timber	2	848	150	7	2,968	697				1	424	250
Narra lumber	32	13,568	3,967	22	9,328	2,104	1	424	150			
Tañgile lumber	329	139,496	11,042	52	22,048	1,982	130	55,120	16,815	24	10,176	3,714
Almon lumber	25	10,600	727	164	69,536	4,081	768	325,632	33,498			
Lauan lumber	13,144	5,573,056	441,972	9,788	4,150,112	285,896	7,800	3,307,200	276,941	5,900	2,501,600	247,608
Guijo lumber	22	9,328	1,523	156	66,144	11,094						
Apitong lumber	913	387,112	23,364	1,334	565,616	40,905						
Miscellaneous lumber	343	145,432	15,196	38	16,112	2,486	1,463	620,312	75,075	2,361	1,001,064	103,698
Total	14,810	6,279,440	497,941	11,599	4,917,976	352,512	10,162	4,308,688	402,479	8,286	3,513,264	355,270

British Africa:												
Lauan timber				21	8,904	677						
Miscellaneous timber				12	5,088	588						
Lauan lumber							(?)		(?)	46	19,504	3,000
Total				33	13,992	1,265				46	19,504	3,000
Singapore:												
Lauan lumber				13	5,512	450	43	18,232	2,827			
Netherlands:												
Tañgile lumber							1	424	102			
Lauan lumber							7	2,968	161			
Total							8	3,392	263			
Guam:												
Tañgile lumber							6	2,544	400			
Apitong lumber	59	25,016	2,250	219	92,856	9,792						
Lauan lumber	7	2,968	760							10	4,240	1,000
Miscellaneous lumber				22	9,328	2,500	26	11,024	864			
Total	66	27,984	3,010	241	102,184	12,292	32	13,568	1,264	10	4,240	1,000
Hawaii:												
Lauan lumber							3	1,272	50			
Spain:												
Narra timber				4	1,696	335						
Apitong timber				2	848	92						
Miscellaneous timber				11	4,664	944						
Narra lumber			110	1	424	71				1	424	550
Tañgile lumber			50	6	2,544	292						
Miscellaneous lumber			130	8	3,392	563						415
Total			290	32	13,568	2,297				1	424	965
Germany:												
Narra lumber				1	424	205						
Miscellaneous lumber				(?)		25						
Total				1	424	230						
France:												
Tañgile lumber	31	13,144	1,600									
Apitong lumber	137	58,088	4,200									
Total	168	71,232	5,800									

Lumber and timber exported from the Philippine Islands—Continued

Species	1923 (January to December)			1922 (January to December)			1921 (January to December)			1920 (January to December)		
	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value
Japan:												
Narra timber				3	1,272	₱171				1	424	₱150
Tañgile timber				3	1,272	113						
Miscellaneous timber	1,325	561,800	₱42,762	25	10,600	1,001	(?)		₱40	21	8,904	4,118
Narra lumber	32	13,568	3,025	33	13,992	2,992	4	1,696	312	(?)		11
Tañgile lumber	164	69,536	7,293	137	58,088	4,859	(?)		12			
Almon lumber	9	3,816	425	107	45,368	2,133						
Lauan lumber	6,953	3,948,072	201,367	243	103,032	7,259	105	44,520	4,893			
Guijo lumber	9	3,816	640	2	848	146						
Apitong lumber	1,312	556,288	14,632	3	1,272	174						
Miscellaneous lumber	972	412,128	39,257	111	47,064	10,022	63	26,712	1,251	15	6,360	5,582
Total	10,776	4,569,024	309,401	667	282,808	28,920	172	72,928	6,508	37	15,688	9,861
Australia:												
Miscellaneous timber	29	12,296	600									
Tañgile lumber	53	22,472	1,003	628	266,272	24,437	38	16,112	2,252	117	49,688	10,301
Almon lumber	1,912	810,688	73,316	2,677	1,135,048	141,259	2,644	1,121,056	152,852	1,102	467,248	57,285
Lauan lumber	4,761	2,018,664	164,390	2,677	1,135,048	111,365	1,710	725,040	81,358	480	203,520	25,850
Apitong lumber				2	848	101						
Miscellaneous lumber				390	165,360	20,699	85	36,040	4,464			
Total	6,755	2,864,120	239,309	6,374	2,702,576	297,861	4,477	1,898,248	240,926	1,699	720,376	93,436
United Kingdom:												
Narra lumber										1	424	192
Tañgile lumber	75	31,800	3,920	337	142,888	16,741	195	82,680	18,386	793	336,232	58,764
Lauan lumber	4,097	1,737,128	141,997	333	141,192	21,682	799	338,776	50,669	1,168	495,232	76,913
Apitong lumber	1,808	766,592	59,117	159	67,416	5,275						
Miscellaneous lumber	154	65,296	5,587	156	66,144	5,622	128	54,272	10,139	459	194,616	34,777
Total	6,134	2,600,816	210,621	985	417,640	49,320	1,122	475,728	79,194	2,421	1,026,504	170,646
Canada:												
Almon lumber										94	39,856	6,000
Lauan lumber										203	86,072	12,538
Apitong lumber	12	5,088	380									
Miscellaneous lumber	57	24,168	3,030									
Total	69	29,256	3,410							297	125,928	18,538

British East Indies:												
Miscellaneous timber										7	2,968	720
Tañgile lumber	229	97,096	8,610				2	848	173			
Apitong lumber				225	95,400	6,636						
Lauan lumber				36	15,264	1,072						
Miscellaneous lumber							24	10,176	2,296	13	5,512	1,711
Total	229	97,096	8,610	261	110,664	7,708	26	11,024	2,469	20	8,480	2,431
To all countries:												
Narra timber	2	848	150	7	2,968	524	106	44,964	6,450	1	424	150
Tañgile timber				12	5,088	663						
Guijo timber	11	4,664	213	29	12,296	2,699						
Apitong timber	71	30,104	1,351	2	848	92						
Lauan timber				21	8,904	677						
Miscellaneous timber	1,684	714,016	49,820	78	33,072	5,673	18	7,632	1,141	77	32,648	6,088
Total timber	1,768	749,632	51,534	149	63,176	10,328	124	52,576	7,591	78	33,072	6,238
Narra lumber	67	28,408	7,695	58	24,592	5,615	5	2,120	462	2	848	753
Tañgile lumber	7,328	3,107,072	308,066	5,500	2,332,000	268,761	2,270	962,480	188,803	7,809	3,311,016	630,167
Amon lumber	3,607	1,529,368	136,438	3,878	1,644,272	184,749	5,804	2,460,896	313,058	3,176	1,346,624	177,598
Lauan lumber	60,111	25,488,064	2,070,704	25,347	10,747,128	885,768	15,201	6,445,224	862,072	18,322	7,768,528	832,957
Guijo lumber	1,624	688,576	82,876	612	259,488	36,511						
Apitong lumber	10,489	4,447,336	298,892	6,191	2,624,984	191,307						
Miscellaneous lumber	2,152	912,448	101,702	1,390	589,360	84,901	4,403	1,866,872	202,678	3,307	1,402,168	186,584
Total lumber	85,378	36,201,272	3,006,373	42,976	18,221,824	1,657,612	27,683	11,737,592	1,567,073	32,616	13,829,184	1,828,059
Grand total	87,146	36,949,904	3,057,907	43,125	18,285,000	1,667,940	27,807	11,790,168	1,574,664	32,694	13,862,256	1,834,297

Lumber and timber imported into the Philippine Islands

Species	1923 (January to December)			1922 (January to December)			1921 (January to December)			1920 (January to December)		
	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value	Cu. m.	Bd. feet	Value
From United States:												
Ties							5,023	2,129,752	₱205,732			
Cedar timber	507	214,968	₱10,632									
Miscellaneous timber	4	1,696	812	5	2,120	₱40	63	26,712	2,588	121	51,304	₱2,149
Pine lumber	3,463	1,468,312	104,820	2,943	1,247,832	79,690	1,043	442,232	56,864	2,545	1,079,080	110,172
Redwood lumber	197	83,528	16,541	44	18,656	3,377	1,123	476,152	89,568	851	360,824	55,185
Cedar lumber	491	208,184	16,838	168	71,232	6,539				270	114,480	11,164
Cedar box shooks			118,991	(?)	(?)	8,371	(?)	(?)	18,000			
Staves			77,758									
Oak lumber				24	10,176	2,348						
Miscellaneous lumber	6	2,544	479	9	3,816	79	12,979	5,503,096	374,679	9,687	4,107,288	451,662
Total	4,668	1,979,232	346,871	3,193	1,253,832	100,444	20,231	8,577,944	747,431	13,474	5,712,976	630,332
From Canada:												
Cedar timber							225	95,400	7,760			
Miscellaneous timber										69	29,256	1,743
Pine lumber				224	94,976	4,738				358	151,792	10,409
Cedar lumber							164	69,536	3,588			
Miscellaneous lumber							3,676	1,558,624	100,749	3,231	1,369,944	82,147
Total				224	94,976	4,738	4,065	1,723,560	112,087	3,658	1,550,992	94,299
From Hongkong:												
Miscellaneous timber										6	2,544	237
Cedar lumber										614	260,336	12,283
Total										620	262,880	12,520
From China:												
Miscellaneous timber	4	1,696	147			272	19	8,056	3,507	2	848	22
Cedar box shooks			3,102									
Staves			41									
Miscellaneous lumber	28	11,872	3,725	35	14,840	827	424	179,776	17,174	142	60,208	4,044
Total	32	13,568	7,015	35	14,840	1,099	443	187,832	20,681	144	61,056	4,066
From Japan:												
Miscellaneous timber							8	2,592	75			

Staves			60									
Miscellaneous lumber						14	26	11,024	189	(?)	(?)	4
Total			60			14	34	13,616	264	(?)	(?)	4
From United Kingdom:												
Miscellaneous timber							7	2,968	146			
From Australia:												
Miscellaneous timber							22	9,328	1,215			
Miscellaneous lumber							233	98,792	18,134			
Total							255	108,120	19,349			
From British East Indies:												
Miscellaneous timber	50	21,200	2,793				45	19,080	1,592	111	47,064	1,516
Miscellaneous lumber	122	51,728	5,620	765	324,360	7,990	346	146,704	36,366	435	184,440	16,063
Total	172	72,928	8,413	765	324,360	7,990	391	165,784	37,958	546	231,504	17,579
From French East Indies:												
Miscellaneous lumber	11	4,664	119	6	2,544	326	116	49,184	832	13	5,512	32
From Spain:												
Miscellaneous lumber										31	13,144	1,302
From Dutch East Indies:												
Miscellaneous timber				49	20,776	160						
From Netherlands:												
Cedar box shooks										(?)	(?)	1,596
From Germany:												
Staves			527									
From Guam:												
Miscellaneous lumber										2	848	200
From Argentina:												
Lignum Vitae				48	20,352	2,092						
From Siberia:												
Miscellaneous lumber	1	424	14									
From all Countries:												
Ties							5,023	2,129,752	205,732			
Cedar timber	507	214,968	10,632				225	95,400	7,760			
Miscellaneous timber	58	24,592	3,752	54	22,896	472	142	59,408	7,908	309	131,016	5,667
Cedar lumber	491	208,184	16,838	168	71,232	6,539	164	69,536	3,588	884	374,816	23,447
Cedar box shooks			122,093	(?)	(?)	8,371	(?)	(?)	18,000	(?)	(?)	1,596
Pine lumber	3,463	1,468,312	104,820	3,167	1,342,808	84,428	1,043	442,232	56,864	2,903	1,230,872	120,581
Redwood lumber	197	83,528	16,541	44	18,656	3,377	1,123	476,152	89,568	851	360,824	55,185
Oak lumber				24	10,176	2,348						
Staves			78,386									
Lignum Vitae lumber				48	20,352	2,092						
Miscellaneous lumber	168	71,232	9,957	815	345,560	9,236	17,800	7,547,200	548,123	13,541	5,741,384	555,454
Total	4,884	2,070,816	363,019	4,320	1,831,680	116,863	25,520	10,819,680	937,543	18,488	7,838,912	761,930

Imports of lumber show a slight increase of some 240,000 board feet in volume and ₱246,000 in value over 1922, but remain far below the large quantities of previous years. While there was some increase in the imports of Oregon Pine, the principal increases were in cedar timber and lumber in volume and in cigar box shooks and barrel staves in value, the volume of the latter not being recorded. Cedar timber is imported in the form of telegraph and telephone poles, but with the trial being made of treated apitong poles, the importation of timber for this purpose should decrease and the imports of wood products be still further confined to special uses and personal preferences of a few users.

UTILIZATION SECTION

The investigation, coöperation, and information service carried under this Section has been handled as personnel and funds permitted, but has had to be largely confined to carrying on the projects started during previous years in investigations of strength, durability, and preservative treatment of woods, and in furnishing available information regarding forest products to present and prospective users.

WOOD PRESERVATION

This industry will be finally established in the Islands when the standard treating plant which the Atlantic Gulf and Pacific Company had purchased in the United States during this year is installed. The cylinder is 7 feet in diameter and 72 feet long. With this equipment, the company will be able to handle large orders, which they are not able to take care of with their present equipment. The treatment of apitong by the common preservative processes has passed the experimental stage, and it now remains for us to investigate more intensively the treatment of lauans and other abundant but perishable woods. In this connection arrangements can undoubtedly be made with the officials of the Atlantic Gulf and Pacific Company to let this Bureau use the small treating cylinders for these studies. Inasmuch as the ranger detailed by the Bureau for wood preservation studies resigned to take charge of the treating plant of the company, a new man should be assigned to carry on the experiments in preservation. About 90 apitong posts for the City of Manila were treated with mixed creosote with an average absorption of seven pounds per cubic foot. These posts are being tried as substitutes for Western red cedar by the Fire Department. Several hundred treated apitong ties were purchased by the

Manila Electric Railroad Company and planted in Santa Ana between McKinley junction and the plaza of Santa Ana, in order to test the lasting qualities of treated apitong as compared with a standard tie timber (molave). Seventy-five hundred apitong ties were treated by various processes of preservation with different amounts of absorption, and will be laid in the sugar centrals in Negros. Upon the completion of the test, data will be available on the best process of wood preservation, the amount of absorption, the kind of oil to employ which will give the maximum life at minimum cost. Ties for the Talisay–Silay Milling Co. at Talisay were laid during the middle part of December, while the majority will be laid early in 1924.

There were treated in all during the year between 300,000 and 400,000 board feet of timber, consisting of ties, bridge timbers, piles, car timbers, etc.

STUDIES IN WOOD STRUCTURE

The study of the structure of wood has progressed considerably. Systematic studies of wood structure, following a well laid out outline, were started during the year, and in this way valuable data will be available for future publications. In fact one of the objects in starting this work at once was to have data available for the revision of Bulletin No. 14 of this Bureau, entitled, "Commercial Woods of the Philippines: Their Preparation and Uses." The sectioning and preparing of slides from blocks of woods which have been softened in hydroflouric acid have been carried on this year, and about 30 or 40 slides have been prepared. The work has not progressed as much as it should, on account of the fact that no man is available who can be assigned principally to histological work. Not all rangers can do this work satisfactorily, because it is such a slow and tedious process that only those interested in the study will succeed.

Experiments in photomicrography of opaque wood structure at low magnifications were made during the year, and it is now known that at magnification up to 15 diameters very satisfactory results can be obtained by using sufficiently strong reflected light with 32 millimeter or 48 millimeter microtessar objectives. Ordinarily photomicrographs are made from thin sections using transmitted light. The advantages of taking pictures of opaque wood are that many features of the wood such as deposits, tyloses, etc., which are often destroyed in sectioning remain intact, and it is also much easier and cheaper to polish a section of wood than to prepare microscopic mounts.

BENDING WOODS

This Office coöperated with the Bureau of Science in wood bending experiments. About a dozen strips of the more common woods were prepared and then steamed and bent by the Bureau of Science. The results, however, were not wholly satisfactory, due to lack of bending apparatus. During the year several parties who were interested in establishing a bent wood furniture factory in Manila, asked for information on the bending qualities of our woods; what little available data we have were given, and in addition these parties were furnished samples of Philippine woods which they sent to the bending factories in the United States for trial. It is very necessary to secure bending apparatus to carry on experiments along this line. A cylinder for conditioning wood, capable of withstanding a pressure up to 200 pounds per square inch, fitted with pressure gauges, thermometers, and piping can be obtained in Manila for not more than three hundred and fifty pesos (₱350).

TIMBER TESTS

The mechanical tests were carried on throughout this year at the Bureau of Science in coöperation with this Bureau. The work proceeded slowly, as only one engineer was detailed to do this work. Three carpenters prepared the material for tests and one of these acted as helper in running the testing machines. In order to hasten the work, two engineers should be detailed to do it, and about four carpenters and one laboratory assistant should continually work on the preparation of the material for testing. A good bench saw capable of cutting up to eight inches thickness should be available. On account of the numerous tests made on each species, only seven species have so far been completed.

CHARCOAL INDUSTRY

As a result of the propaganda conducted by this Bureau, the College of Agriculture and the the School of Forestry, there is a notable increase in the number of people who use charcoal as domestic fuel in place of firewood. A number of parties called at this Office to gather information on how to build the Japanese type of charcoal kilns. Japanese and Filipinos are now actively engaged in the charcoal industry and as a result the price of charcoal has considerably lowered.

IDENTIFICATION

Numerous samples of woods were received from various sources for identification. The majority of the samples were

sent in by forest officers and lumbermen. The engineers of the Bureau of Public Works and the different sugar centrals also submitted numerous samples for identification. During the year this Bureau received samples from the United States, Australia, and Japan for identification.

STUDIES IN SPECIAL WOOD USING INDUSTRIES

Here is a study that can well be pursued with advantage. Certain industries like the toy industry, and the manufacture of shuttles and bobbins, musical instruments, golf shafts, polo clubs, fishing rods, and other sporting goods and equipments need woods of special properties. We have many species for just these industries which do not require as much material as the manufacture of furniture and cabinet work. For shuttles and bobbins, a fine textured, straight grained and light colored hardwood is needed. Boxwood is used for the best grades, and for substitutes we have narig, bakauan, pototan, aranga, manggachapui and many others.

About a dozen species of polo heads were tried this year and those that are promising are lumbayau-batu, palomaria, malugai, and sampalok. American polo heads are invariably made of hard maple (*Acer sacharrum*). A tough, medium heavy wood is needed for this purpose. Two dozen golf shafts were made out of different woods and given to experienced golf players. No report has as yet been received but it seems that yakal, aranga, and palma brava will be satisfactory material for shafts. Imported shafts are invariably made of hickory and some of steel.

EXTENSION SERVICE

This section furnishes free of charge information on the durability, uses, and supply of woods. Foreign woods are often presented for identification with the object of ascertaining whether substitutes can be obtained in the Islands. Many telephone calls are received in this office asking for information on woods. Letters from various sources, many from abroad, request for similar information.

There are no less than 700 students from all government high schools in the City that visited the Working Collection of the Bureau in connection with their studies in Biology. The students visit the working collection, and while they are in the Bureau, lectures are given by the technical personnel on forestry and forest products. Every help is extended to all parties desiring information on forestry and forest products.

For the benefit of those engaged in the sale and purchase of wood, there is being planned a two-week course in wood iden-

tification and seasoning. The proposed plan is to give a few popular lectures on forest conditions in the Islands, and on the identification and properties of commercial woods. A nominal enrollment fee of 15 or 20 pesos may be charged to help defray expenses, and in order to test the good faith of attendants.

WORKING COLLECTION

The working collection of the Bureau is one of its most valuable properties and is the basis of most of all our information on native woods. It has grown in the same proportion as the herbarium of the Bureau of Science, as most of the materials were collected with botanical specimens which are now kept in the Government Herbarium. With the publication of Dr. Merrill's "An Enumeration of Philippine Flowering Plants," a revision of all samples will have to be made as the nomenclature of many species has been changed.

The minor forest products, consisting of resins, oils, rubber, gutta-percha, rattans, etc., are fairly well represented but are by no means complete. No systematic collection has ever been made of the minor forest products, such as was made in the case of wood specimens. The matter will be gone into this coming year, as personnel and money become available. A good collection of crude rubber was donated by the American Rubber Company and Basilan Plantation Company. Samples of bleached and unbleached pulp of bamboo, cogon, and other common grasses which are available in large quantities were presented to the Bureau by Mr. C. W. Mason, an experienced pulp and paper manufacturer in Hawaii. A few samples of medicinal plants were added to the collection.

DURABILITY TESTS

The examination of the 36 apitong ties treated by the Atlantic Gulf and Pacific Company in coöperation with this Bureau show that the ties are still unaffected by decay. The first lot of 7,500 treated apitong ties which were treated by the Atlantic Gulf and Pacific Company, for the Philippine Sugar Central Agency were laid by the Talisay–Silay Milling Co. during the latter part of the year. The rest of the lot, numbering about 6,000, will be placed very early this coming year. Careful records will be made of the conditions to which these ties are subjected. The paving blocks which were laid by the City of Manila are still serviceable. The last examination showed that there are a number of depressions in the experimental area, due apparently to the faulty foundation rather than decay of the blocks.

A paper entitled "Relative Durability of Native Woods" was compiled by Forest Supervisor Jose F. Nano and will be published early this year in several journals. The data obtained from previous tests of this Bureau have been supplemented with observations from various sources by its technical personnel.

SALE AND DISTRIBUTION OF SPECIMENS

There were sold during the year 750 handspecimens, and about 4,600 were distributed gratis. From the latter number the forest stations obtained about 600, the Forest School about 3,000, and 1,000 were given gratis to lumbermen, who sent them abroad as samples to prospective buyers. New planks and log specimens amounting to 11 and 42, respectively, were added to the collection. Besides the 3,000 specimens sent to the Forest School for use of the students in Wood Technology there were furnished two sacks full of samples of different shapes and sizes of most commercial woods. These will be used for examination purposes. Beginners in wood identification are inclined to depend too much upon the shape, color, and appearances of the sample furnished rather than upon the structure of the wood, and as a result, when given common woods of different shapes and sizes, the students are apt to fail to identify them. With a variety of shapes and sizes before them, students will be compelled to depend more on the structure of woods, which is the most positive means of recognizing them.

CARPENTRY SHOP

This Office maintains a small carpentry shop for preparing specimens for the working collection of the Bureau. All samples for sale or for exchange are also prepared in the shop. Besides this routine work the shop also makes minor repairs of office furniture and equipment. During the year the shop built three cases to contain the specimens for sale and exchange, and a permanent handspecimen case, besides doing many small jobs, such as the repairing of office furniture, making samples of gold shafts, polo heads, fishing rods, etc.

PROPOSED WORK FOR 1924

1. Continuation of experiments in wood preservation.
2. Studies of wood structure.
3. Examination of durability test specimens in the various sugar centrals. Study cause of deteriorations of wooden parts of imported automibiles, furniture, musical instruments, etc.
4. Study of lumber seasoning, by artificial and natural means.

5. Systematic classification and collection of minor forest products.

6. Continued coöperation with the Bureau of Science with regard to mechanical tests and study of chemical utilization of forest products.

7. Continued coöperation with lumbermen and the wood using industries in giving out information on woods and minor forest products.

8. The giving of a short course of study in lumber drying, and wood identification for the benefit of those engaged in selling and buying woods.

9. Repolishing of planks and log specimens in the working collection.

DIVISION OF FOREST LANDS AND MAPS

IN GENERAL

The constant aim of this Division during the calendar year 1923 has been to solve in a practical way the problems presented and to bend all its efforts towards obtaining tangible results in all its activities in proportion to the funds and personnel available, the result of which is that this Division has broken all its previous records, as graphically shown in the summaries of work accomplished by its different sections.

LEGISLATION

The most important law passed by the Philippine Legislature which greatly concerns this Division is Act 3077, which amends section 1844 of the Administrative Code to the effect that *all public lands not classified as timber lands* are placed under the jurisdiction of the Bureau of Lands. This Office, desiring to know whether or not the provisions of Sections 1 and 5 of the said Act are amendatory to sections 1816, 1820, 1827, and 1838 of the Revised Administrative Code in that part referring to public lands not yet classified or not lawfully reserved, brought the matter to the attention of the Attorney-General, who rendered an opinion under date of June 1, 1923, confirming the contention of this Bureau that the Act in question was not amendatory to the provisions of the sections mentioned in the Administrative Code.

PERSONNEL

The field and office force of this Division at the end of the year consists of the following: 1 forester, 1 forest supervisor, 1 forest surveyor, 36 rangers, 1 forest guard, 11 draftsmen, 5 clerks, and 1 messenger.

LAND CLASSIFICATION

The Bureau of Forestry has always borne in mind the policy of the Government to encourage the acquisition of lands of the public domain, thereby putting to beneficial use all such lands possible. In line with this policy, this Bureau gave special attention during the year to the classification and certification of large areas of public lands, as a matter of coöperation with the Bureau of Labor in order to solve the important problem of Philippine Intermigration; to the numerous requests from the Director of Lands for certification of individual public land applications and of large areas for alienation or disposition under the Public Land Law; and to the certification, in pursuance to Proclamation No. 4, series 1923, of the Governor General, of all lands declared as public lands by the Court of Land Registration in ordinary and cadastral cases.

This Division exerted every effort to simplify the procedure and to concentrate all the available field and office force upon these lines of work in order to carry them out in the most expeditious and inexpensive manner possible. The system of extensive land classification has been resorted to in the establishment of boundaries between forest zones and regions alienable and disposable, in order to avoid the delay and expense of putting intensive study on areas which are clearly alienable and disposable under the Public Land Act. The work of classification of large areas and of small ones under individual applications was combined. The former was carried on in those regions where there are numerous applications received or expected to be received, but in those cases where applications are distributed far apart and few in number, the individual system of inspection was practiced.

Through special arrangement with the Bureau of Lands and the General Land Registration Office, this Office was able to certify during the year 206 projects containing a total area of 1,375,944.32 hectares, as compared with 19 projects containing a total area of 338,064.31 hectares in the previous year. It should be noted in this connection that 155 projects, containing a total area of 538,622.68 hectares are under ordinary and cadastral cases which were certified without performing any further field work.

The following three tables show the land classification projects certified during the current year, pending at the close of the year, and those certified since the enactment of the new Public Land Law on November 29, 1919:

Statement of land classification projects certified during the year 1923

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable or disposable	Forest zone	Total		
1	Proclamation No. 4	S. 1923	Albay	Albay			12-17-23	229.98	25.00	254.98	(a)	Legaspi Cadastre, B. L. Case No. 1.
2	Do	do	do	do			do	526.18	10.00	536.18	(a)	Legaspi Cadastre, B. L Case No. 2.
13	Director of Forestry	3-31-21	Apayao	Calasitan, Ripang, Tauit, Nagbanaggan, and Cagadiongan.	4- 2-21	9-13-21	2-27-23	20,520.00		20,520.00	(b)	
2	Director of Lands	9-28-23	Bataan	Samal			8- 1-23	3,300.80		3,300.80	(a)	Samal Cadastre, B. L. Case No. 2.
4	Proclamation No. 4	S. 1923	do	Mariveles			11-23-23	264.34		264.34	(a)	B. L. Cadastral No. 36.
5	Do	do	do	Balanga			do	501.76	246.29	748.05	(a)	Balanga Cadastre, B. L. Case No. 1.
6	Do	do	do	do			do	4,433.44	2,968.20	7,401.64	(a)	Balanga Cadastre, B. L. Case No. 2.
7	Do	do	do	Pilar			do	1,408.20	1,959.54	3,367.74	(a)	Pilar Cadastre, G. L. R. O. Record Nos. 166 and 8411.
8	Do	do	do	Orion and Pilar			do	831.46		831.46	(a)	Orion and Pilar Cadastre, B. L. Case No. 6.
1	Do	do	Batangas	Balayan			12-12-23	65.81		65.81	(a)	Balayan Cadastre, B. L. Case No. 1.
2	Do	do	do	do			do	2,169.56		2,169.56	(a)	Balayan Cadastre, B. L. Case No. 2.
19	Proclamation No. 67	S. 1920	Bukidnon	Malaybalay			1-12-23	2,488.40		2,488.40	(a)	B. L. Cadastral No. 158.
13	Proclamation No. 65	do	Cagayan	All, except Calayan.	4- 2-21	9-13-21	2-27-23	217,295.00	2,779.00	220,074.00	(b)	
1	Proclamation No. 4	S. 1923	Cavite	Cavite			11-23-23	44.28		44.28	(a)	Cavite Cadastre, B. L. Case No. 2.
2	Do	do	do	do			12-18-23	20.81		20.81	(a)	Cavite Cadastre, B. L. Case No. 1.
1	Resolution No. 116, Municipal Council.	S. 1922	Cebu	Ronda			6-18-23	2.40		2.40	(a)	B. L. Plan II-356.
2	Proclamation No. 4	S. 1923	do	Cebu			11-23-23	515.70		515.70	(a)	Cebu Cadastre, B. L. Case No. 3.
3	Do	do	do	do			do	683.06		683.06	(a)	Cebu Cadastre, B. L. Case No. 4.

4	Do	do	do	do			do	188.06	95.65	283.71	[a]	Cebu Cadastre, B. L. Case No. 6.
7	Do	do	do	Carcar			do	519.92	103.90	623.82	[a]	Carcar Cadastre, B. L. Case No. 2.
9	Do	do	do	do			do	1,313.40		1,313.40	[a]	Carcar Cadastre, B, L. Case No. 4.
10	Do	do	do	do			do	1,707.82		1,707.82	[a]	Carcar Cadastre, B. L. Case No. 6.
1	Proclamation No. 4	do	Cotabato	Cotabato			3-21-23	6,556.90		6,556.90	[a]	Cotabato Cadastre, B. L. Case No. 1.
2	Do	do	do	do			do	3,382.18		3,382.18	[a]	Cotabato Cadastre, B. L. Case No. 2.
3	Do	do	do	Sinamuay	9- 8-21	9- 9-21	5- 8-23	2,241.84		2,241.84	[a]	Sinamuay Cadastre, B. L. Cadastral No. 123.
24	Proclamation No. 67	S. 1920	do	Maganoy	10-20-22	10-20-22	1-17-23	2,675.96		2,675.96	₱13.81	Agricultural Colony No. 4.
25	Do	do	do	Pikit-Pagalongan.	10-23-22	10-23-22	do	4,475.15		4,475.15	13.81	Agricultural Colony No. 5.
26	Do	do	do	Silik	10-24-22	10-25-22	do	1,719.43		1,719.43	27.61	Agricultural Colony No. 7.
27	Do	do	do	Glan	10-27-22	11- 5-22	do	1,887.60		1,887.60	138.07	Agricultural Colony No, 9.
28	Do	do	do	Silik	10-21-22	10 22-22	do	514.59	9.25	523.84	27.61	Agricultural Colony No. 2.
29	Do	do	do	do	10-27-22	10-28-22	do	1,277.02		1,277.02	27.61	Agricultural Colony No. 15.
30	Do	do	do	Cotabato	9- 7-22	9- 8-22	1-30-23	1,363.01		1,363.01	27.61	Tabuan Cadastre, B. L. Case No. 130.
31	Do	do	do	Tuguis	10-11-22	10-24-22	1-31-23	3,984.93	287.50	4,272.43	193.29	Tuguis Cadastre, B. L. Cadastral No. 152.
38	Do	do	do	Kraan			11-23-23	3,606.54	106.88	3,713.42	[a]	Kraan Cadastre, B. L. Cadastral No. 153.
39	Do	do	do	Cotabato			2-19-23	5,456.09		5,456.09	[a]	Cotabato Cadastre, B. L. Case No. 2.
1	Do	do	Davao	Davao	3-12-23	4-10-23	8- 6-23	20,094.00	13,100.11	33,194.11	₱328.15	Davao Cadastre, B. L. Cadastral No. 102.
1	Proclamation No. 4	S. 1923	Ilocos Norte	Dingras			11-23-23	148.43		148.43	[a]	Dingras Cadastre, B. L. Case No. 1.
2	Do	do	do	do			do	96.90		96.90	[a]	Dingras Cadastre, B. L. Case No. 2.
3	Do	do	do	do			do	111.99		111.99	[a]	Dingras Cadastre, B. L. Case No. 3.
4	Do	do	do	do			do	138.64		138.64	[a]	Dingras Cadastre, B. L. Case No. 4.
13	Director of Forestry	3-31-21	do	Langangan	4-2-21	9-13-21	2-27-23	395.00		395.00	[b]	
1	Proclamation No. 4	S. 1923	Iloilo	La Paz			11-23-23	749.07		749.07	[a]	Iloilo Cadastre, G. L. R. O. Record No. 1.

[a] No expenses given covering field work, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Total expenses for Project No. 13, Apayao, Cagayan, Ilocos Norte, Isabela, Kalinga, and Nueva Vizcaya, ₱9,044.46.

Statement of land classification projects certified during the year 1923—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable or disposable	Forest zone	Total		
2	Proclamation No. 4	S. 1923	Iloilo	Pototan			11-23-23	603.80		603.80	(a)	Pototan Cadastre, B. L. Case No. 1.
3	Do	do	do	do			do	2,591.64		2,591.64	(a)	Pototan Cadastre, G. L. R. O. Record No. 21.
4	Do	do	do	Santa Barbara			do	399.51		399.51	(a)	Santa Barbara Cadastre, B. L. Case No. 1.
5	Do	do	do	Iloilo			do	1,199.38		1,199.38	(a)	Agonoa Cadastre, B. L. Case No. 1.
6	Do	do	do	do			do	305.29		305.29	(a)	Iloilo Cabastre, B. L. Case No. 3.
7	Do	do	do	do			do	284.18		284.18	(a)	Iloilo Cadastre, B. L. Case No. 4.
8	Do	do	do	do			do	451.59		451.59	(a)	Iloilo Cadastre, B. L. Case No. 5-A.
9	Do	do	do	Santa Barbara			do	1,158.48	699.47	1,857.95	(a)	Santa Barbara Cadastre, B. L. Case No. 4.
10	Do	do	do	do			do	2,376.48		2,376.48	(a)	Santa Barbara Cadastre, B. L. Case No. 5.
11	Do	do	do	do			do	917.07		917.07	(a)	Santa Barbara Cadastre, B. L. Case No. 6.
12	Do	do	do	do			do	332.02		332.02	(a)	Pototan Cadastre, G. L. R. O. Record No. 14.
13	Do	do	do	do			do	308.02		308.02	(a)	Agonoa Cadastre, B. L. Case No. 4.
14	Do	do	do	do			do	1,455.51		1,455.51	(a)	Iloilo Cadastre, G. L. R. O. Record No. 11.
15	Do	do	do	Oton			do	1,612.61		1,612.61	(a)	Agonoa Cadastre, G. L. R. O. Record No. 19.
16	Do	do	do	do			do	771.30		771.30	(a)	Agonoa Cadastre, G. L. R. O. Record No. 18.
17	Do	do	do	do			do	430.11		430.11	(a)	Iloilo Cadastre, G. L. R. O. Record No. 9742.
18	Do	do	do	do			do	547.96		547.96	(a)	Iloilo Cadastre, G. L. R. O. Record No. 20.

19	Do	do	do	San Miguel			do	1,080.93		1,080.93	(a)	Agonoa Cadastre, G. L. R. O. Record No. 16.
20	Do	do	do	Arevalo			do	506.25		506.25	(a)	Iloilo Cadastre, G. L. R. O. Record No. 9741.
21	Do	do	do	Pavia			do	679.66		679.66	(a)	Iloilo Cadastre, G. L. R. O. Record No. 5.
22	Do	do	do	Tigbauan			do	261.32		261.32	(a)	Iloilo Cadastre, G. L. R. O. Record No. 23.
23	Do	do	do	Cabatuan			do	623.90		623.90	(a)	Iloilo Cadastre, G. L. R. O. Record No. 4.
24	Do	do	do	do			do	809.67		809.67	(a)	Iloilo Cadastre, G. L. R. O. Record No. 3.
25	Do	do	do	do			do	426.86		426.86	(a)	Iloilo Cadastre, G. L. R. O. Record No. 2.
26	Do	do	do	Jaro			do	909.24		909.24	(a)	Iloilo Cadastre, G. L. R. O. Record No. 9959.
27	Do	do	do	do			do	1,748.60		1,748.60	(a)	Iloilo Cadastre, G. L. R. O. Record No. 6.
28	Do	do	do	do			do	813.82		813.82	(a)	Agonoa Cadastre, G. L. R. O. Record No. 7.
30	Do	do	do	Calinog			12-12-23	10,838.38		10,838.38	(a)	Calinog Cadastre, B. L. Case No. 2.
1	Proclamation No. 66	S. 1920	Isabela	Jones	9- 7-22	9-11-22	7-20-23	554.00		554.00	₱15.00	
13	Do	do	do	All	4- 2-21	9-13-21	2-27-23	243,915.00	10,176.00	254,091.00	(b)	
13	Director of Forestry	3-31-21	Kalinga	Pinukpuk, Tabuk, and Ripang.	do	do	do	7,632.00		7,632.00	(b)	
2	Proclamation No. 4	S. 1923	Laguna	Lumban			12-17-23	1,759.44	96.10	1,855.54	(a)	Calaraya Cadastre, B. L. Case No. 2.
3	Do	do	do	Cavinti			11-23-23	1,021.80	15.50	1,037.30	(a)	Cavinti Cadastre, B. L. Case No. 1.
37	Proclamation No. 67	S. 1920	Lanao	Momungan, Iligan, Kolambugan, and Kapatagan.	8-30-22	12-16-22	7-16-23	44,337.00		44,337.00	843.42	
37-A	Do	do	do	Momungan	6-21-23	6-21-23	9-5-23	60.00		60.00	7.50	Portion of American Colony Site.
1	Director of Lands	11-12-23	La Union	Rosario			11-28-23	1,678.80		1,678.80	(a)	Rosario Cadastre, B. L. Case No. 1.
2	Do	do	do	do			12-17-23	5,206.20	706.80	5,913.00	(a)	Rosario Cadastre, B. L. Case No. 2.

[a] No expenses given covering field work, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Total expenses for Project No. 13, Apayao, Cagayan, Ilocos Norte, Isabela, Kalinga, and Nueva Vizcaya, ₱9,044.46.

Statement of land classification projects certified during the year 1923—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable or disposable	Forest zone	Total		
2	Proclamation No. 4	S. 1923	Leyte	Caibiran			12-17-23	2.05	16.83	18.88	(a)	G. L. R. O. Record No. 11575.
38	Director of Forestry	8-21-22	Misamis	Misamis	11-24-22	12-10-22	7-16-23	6,947.00	330.00	7,277.00	₱76.00	
1	Proclamation No. 4	S. 1923	Occidental Negros.	Pontevedra			12-17-23	8,327.05	382.01	8,709.06	(a)	Pontevedra Cadastre, B. L. Case No. 1.
2	Do	do	do	do			11-21-23	16,937.96	1,121.88	18,059.84	(a)	Pontevedra Cadastre, B. L. Case No. 2.
3	Do	do	do	Murcia			do	21,008.15	409.20	21,417.35	(a)	Murcia Cadastre, G. L. R. O. Record No. 73.
4	Do	do	do	Silay			do	17,073.90	411.30	17,485.20	(a)	B. L. Cadastral No. 49.
5	Do	do	do	Binalbagan			do	5,319.35	2,358.94	7,678.29	(a)	B. L. Cadastral No. 89.
6	Do	do	do	Talisay			do	13,662.73		13,662.73	(a)	B. L. Cadastral No. 48.
8	Do	do	do	Bacolod			do	16,145.83		16,145.83	(a)	Bacolod Cadastre, G. L. R. O. Record No. 55.
9	Do	do	do	Bago			do	14,613.58		14,613.58	(a)	Bago Cadastre, B. L. Case No. 1.
10	Do	do	do	do			do	22,796.70		22,796.70	(a)	Bago Cadastre, B. L. Case No. 2.
11	Do	do	do	Valladolid			do	4,903.87		4,903.87	(a)	Valladolid Cadastre, G. L. R. O. Record No. 25.
13	Do	do	do	Victorias			12-17-23	8,440.20	1,013.00	9,453.20	(a)	Victorias Cadastre, G. L. R. O. Record No. 81.
14	Do	do	do	Saravia			do	10,153.71	1,671.70	11,825.41	(a)	B. L. Cadastral No. 50.
15	Do	do	do	Hinigaran			11-21-23	3,748.14	269.47	4,017.61	(a)	Hinigaran Cadastre, B. L. Case No. 1.
16	Do	do	do	do			do	10,750.45	724.80	11,475.25	(a)	Hinigaran Cadastre, B. L. Case No. 2.
18	Do	do	do	Isabela			12-17-23	22,726.90	6,288.70	29,015.60	(a)	B. L. Cadastral No. 62.
1	Do	do	Oriental Negros.	Dumaguete			12-12-23	669.62		669.62	(a)	Dumaguete Cadastre, B. L. Case No. 3.
2	Do	do	do	do			do	812.27		812.27	(a)	Dumaguete Cadastre, B. L. Case No. 4.

1	Do	do	Nueva Ecija	San Jose			9- 7-23	3,120.12		3,120.12	(a)	San Jose Cadastre, B. L. Case No. 1.
1-A	Do	do	do	do			9-13-23	4,370.00	2,587.80	6,957.80	(a)	San Jose Cadastre, B. L. No. Case No. 2.
1-B	Do	do	do	do			do	5,844.44	2,548.00	8,392.44	(a)	San Jose Cadastre, B. L. Case No. 3.
1-C	Do	do	do	do			12- 7-23	497.15		497.15	(a)	Portion of San Jose Cadastre, B. L. Case No. 3.
2	Do	do	do	Lupao			10-19-23	5,073.50	787.37	5,860.87	(a)	Lupao Cadastre, B. L. Case No. 2.
4	Do	do	do	Cuyapo			do	16,644.04	978.66	17,622.70	(a)	Cuyapo Cadastre, B. L. No. Case No. 2.
5	Do	do	do	do			9-25-23	3,863.09	202.56	4,465.65	(a)	Cuyapo Cadastre, B. L. Case No. 1.
6	Do	do	do	Lupao			10-19-23	4,067.14	3,030.35	7,097.49	(a)	Lupao Cadastre, B. L. Case No. 1.
7	Director of Forestry	12-2-22	do	San Antonio	2- 9-23	3- 7-23	11-28-23	81,585.90	3,641.30	85,227.20	(b)	Area given includes those of Projects Nos. 13, 25-31, and 39.
8-A	Proclamation No. 4	S. 1923	do	Cabanatuan			9-27-23	2,876.88		2,876.88	(a)	Cabanatuan Cadastre, B. L. Case No. 1.
8-B	Do	do	do	do			9-26-23	25,819.99		25,819.99	(a)	Cabanatuan Cadastre, B. L. Case No. 2 and B. L. Cadastral No. 97.
9	Director of Forestry	12-2-22	do	Santa Rosa			12-12-23	11,732.80		11,732.80	(b)	
10	Proclamation No. 4	S. 1923	do	Rizal			6- 1-23	4,592.65	292.00	4,488.65	(a)	Rizal Cadastre, B. L. Cases Nos. 1 and 2.
11	Do	do	do	do			5-29-23	6,598.84	682.40	7,281.24	(a)	Rizal Cadastre, B. L. No. 3.
12	Do	do	do	Laur	7-10-23	7-25-23	10-31-23	6,921.50		6,921.50	₱158.30	
13	Director of Forestry	12-2-22	do	San Leonardo			11-28-23				(a)	Area corresponding to this project has been included under Nueva Ecija Project No. 7.
14	Do	do	do	Peñaranda			do	12,114.20		12,114.20	(b)	
15	Do	do	do	Gapan	6- 2-23	8- 3-23	do	11,904.20		11,904.20	(b)	
17	Proclamation No. 4	S. 1923	do	Muñoz			9-18-23	4,860.05		4,860.05	(a)	Muñoz Cadastre, B. L. Case No. 1.
19	Do	do	do	do			do	5,555.06		5,555.06	(a)	Muñoz Cadastre, B. L. Case No. 2.
21	Do	do	do	Talavera			9-22-23	9,913.45		9,913.45	(a)	Talavera Cadastre, B. L. Case No. 1.
22	Do	do	do	do			do	4,635.26		4,635.26	(a)	Talavera Cadastre, B. L. Case No. 2.

[a] No expenses given covering field work, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Total expenses for Nueva Ecija Projects Nos. 7, 9, 14, 15, and 37, ₱1,627.28.

Statement of land classification projects certified during the year 1923—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable or disposable	Forest zone	Total		
23	Director of Forestry	7-9-23	Nueva Ecija	Bongabon			10-31-23	497.00		497.00	(a)	
25	Do	12-2-22	do	Licab			11-28-23				(a)	Area corresponding to this project has been included under Nueva Ecija Project No. 7.
26	Do	do	do	Zaragoza			do					Do.
27	Do	do	do	Aliaga			do					Do.
28	Do	do	do	Santo Domingo			do				(a)	Do.
29	Do	do	do	San Isidro			do				(a)	Do.
30	Do	do	do	Jaen			do				(a)	Do.
31	Do	do	do	Cabiao			do				(a)	Do.
32	Proclamation No. 4	S. 1920	do	Guimba			10-19-23	10,405.49		10,405.49	(a)	Guimba Cadastre, B. L. Case No. 1.
33	Do	do	do	do			do	3,055.96		3,055.96	(a)	Guimba Cadastre, B. L. Case No. 2.
34	Do	do	do	do			do	6,089.72		6,089.72	(a)	Guimba Cadastre, B. L. Case No. 3.
35	Do	do	do	do			do	5,247.63		5,247.63	(a)	Guimba Cadastre, B. L. Case No. 4.
36	Director of Forestry	5-26-22	do	Carranglan and Pantabangan.	6-26-22	8- 1-22	10-31-23	12,419.00		12,419.00	₱343.56	
37	Do	12-2-22	do	Papaya	7-27-23	8-1-23	11-28-23	6,525.60		6,525.60	(b)	
38	Do	do	do	Nampicuan			11-27-23	4,228.13		4,228.13	(a)	
39	Do	do	do	Quezon			11-28-23				(a)	
1	Proclamation No. 64	S. 1920	Nueva Vizcaya.	Bagabag	2-26-23	6-20-23	12-28-23	178.69		178.69	(b)	Region east of Magat River.
2	Do	do	do	Solano	do	do	do	6,582.85		6,582.85	(b)	Do.
3	Do	do	do	Bayombong	do	do	do	788.02		788.02	(b)	Do.
4	Do	do	do	Bambang	do	do	do	2,032.52	62.47	2,094.99	(b)	Do.
5	Do	do	do	Dupax	do	do	do	4,238.01	24.03	4,262.04	(b)	Do.
6	Do	do	do	Aritao	do	do	do	2,570.68		2,570.68	(b)	
13	Do	do	do	Portion adjacent to Isabela.	4- 2-21	9-13-21	2-27-23	7,862.00		7,862.00	(b)	
1	Director of Forestry	12-2-22	Palawan	Puerto Princesa.	12-23-22	2- 6-23	12-29-23	4,648.40		4,648.40	c ₱926.14	
2	Proclamation No. 4	S. 1923	do	Coron			11-23-23	61.39		61.39	(a)	Coron Cadastre, B. L. Cadastral No. 33.

3	Do	do	do	do			do	7.93		7.93	[a]	Coron Cadastre, B. L. Cadastral No. 35.
4	Do	do	do	do			do	8.37		8.37	[a]	Coron Cadastre, B. L. Cadastral No. 34.
1	Do	do	Pampanga	San Fernando			do	1,576.55	408.00	1,984.55	[a]	San Fernando Cadastre, B. L. Case No. 2.
2	Do	do	do	do			12-12-23	2,720.68		2,720.68	[a]	San Fernando Cadastre, B. L. Case No. 3.
3	Do	do	do	do			do	3,061.18		3,061.18	[a]	San Fernando Cadastre, B. L. Case No. 4.
4	Do	do	do	Magalang			12-17-23	9,103.90	781.25	9,885.15	[a]	Magalang Cadastre, G. L. R. O. Record No. 128.
5	Do	do	do	Mabalacat			12-12-23	8,318.00		8,318.00	[a]	Mabalacat Cadastre, G. L. R. O. Record No. 132.
6	Do	do	do	Bacolor			do	999.30		999.30	[a]	Bacolor Cadastre, B. L. Case No. 2.
7	Do	do	do	do			11-23-23	1,430.96		1,430.96	[a]	Bacolor Cadastre, B. L. Case No. 3.
8	Do	do	do	Mexico			12-12-23	3,035.25		3,035.25	[a]	Mexico Cadastre, B. L. Case No. 2.
23	Director of Forestry	8-1-22	do	Arayat	3-26-23	3-27-23	6-25-23	8,526.00	3,975.93	12,501.93	₱215.40	
3	Proclamation No. 4	S. 1923	Pangasinan	Asingan			11-28-23	604.15		604.15	[a]	Agno River Project, Asingan Case No. 1.
4	Do	do	do	do			do	777.47		777.47	[a]	Agno River Project, Asingan Case No. 2.
5	Do	do	do	do			do	925.07		925.07	[a]	Agno River Project, Asingan Case No. 3.
6	Do	do	do	do			do	799.60		799.60	[a]	Agno River Project, Asingan Case No. 4.
7	Do	do	do	do			do	831.17		831.17	[a]	Agno River Project, Asingan Case No. 5.
8	Do	do	do	do			do	1,237.21		1,237.21	[a]	Agno River Project, Asingan Case No. 6.
9	Do	do	do	do			do	1,077.91		1,077.91	[a]	Agno River Project, Asingan Case No. 7.
10	Do	do	do	do			do	833.27		833.27	[a]	Agno River Project, Asingan Case No. 8.
11	Do	do	do	Binalonan			11-23-23	153.17		153.17	[a]	Agno River Project, Binalonan Case No. 1.
12	Do	do	do	do			11-28-23	1,151.52		1,151.52	[a]	Agno River Project, Binalonan Case No. 2.

[a] No expenses given covering field work, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Total expenses for Nueva Vizcaya Projects Nos. 1 to 6, inclusive, ₱258.61, and Nueva Ecija Projects Nos. 7, 9, 14, 15, and 37, ₱1,627.28.

[c] Paid by the Provincial Government of Palawan.

Statement of land classification projects certified during the year 1923—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable or disposable	Forest zone	Total		
13	Proclamation No. 4	S. 1923	Pangasinan	San Manuel			11-23-23	66.21		66.21	(a)	San Manuel Cadastre, B. L. Case No. 1.
14	Do	do	do	do			do	1,079.15		1,079.15	(a)	San Manuel Cadastre, B. L. Case No. 2.
15	Do	do	do	do			11-28-23	1,424.28		1,424.28	(a)	San Manuel Cadastre, B. L. Case No. 3.
16	Do	do	do	do			11-23-23	912.27		912.27	(a)	San Manuel Cadastre, B. L. Case No. 6.
17	Do	do	do	do			11-28-23	203.00		203.00	(a)	San Manuel Cadastre, B. L. Case No. 7.
18	Do	do	do	Urdaneta			do	812.94		812.94	(a)	Agno River Project, Urdaneta Case No. 2.
19	Do	do	do	do			do	469.52		469.52	(a)	Agno River Project, Urdaneta Case No. 3.
20	Do	do	do	do			do	578.73		578.73	(a)	Agno River Project, Urdaneta Case No. 4.
21	Do	do	do	do			do	528.09		528.09	(a)	Agno River Project, Urdaneta Case No. 6.
22	Do	do	do	do			do	542.93		542.93	(a)	Agno River Project, Urdaneta Case No. 7.
23	Do	do	do	Villasis			11-23-23	822.26		822.26	(a)	Villasis Cadastre, B. L. Case No. 1.
24	Do	do	do	do			do	1,235.30		1,235.30	(a)	Villasis Cadastre, B. L. Case No. 4.
25	Do	do	do	do			do	1,797.22		1,797.22	(a)	Villasis Cadastre, B. L. Case No. 5.
26	Do	do	do	Urbistondo			do	686.83		686.83	(a)	Urbistondo Cadastre, B. L. Cadastral No. 31.
27	Do	do	do	San Carlos			11-28-23	1,118.24		1,118.24	(a)	San Carlos Cadastre, B. L. Cadastral No. 44
1	Do	do	Rizal	Antipolo			11-23-23	574.22		574.22	(a)	Antipolo Cadastre, B. L. Case No. 1.

2	Do	do	do	Teresa			do	680.04		680.04	[a] Teresa Cadastre, B. L. Case No. 1.
3	Do	do	do	Cainta			do	340.06		340.06	[a] Cainta Cadastre, B. L. Case No. 1.
4	Do	do	do	do			12-12-23	248.25		248.25	[a] Cainta Cadastre, B. L. Case No. 2.
5	Do	do	do	Taytay			11-23-23	305.57		305.57	[a] Taytay Cadastre, B. L. Case No. 1.
1	Director of Forestry	12- 9-22	Tarlac	Victoria			5-31-23	1,681.57		1,681.57	[a] Victoria Cadastre, B. L. Case No. 7.
2	Director of Lands	4-30-23	do	La Paz			6- 4-23	4,674.97		4,674.97	[a] La Paz Cadastre, B. L. Case No. 6.
3	Do	11- 6-22	do	Concepcion			6- 7-23	4,831.46		4,831.46	[a] Concepcion Cadastre, B. L. Case No. 1.
4	Do	do	do	do			6- 8-23	8,650.19		8,650.19	[a] Concepcion Cadastre, B. L. Case No. 2.
5	Do	do	do	do			6-13-23	8,572.70	110.40	9,683.10	[a] Concepcion Cadastre, B. L. Case No. 3.
6	Proclamation No. 4	S. 1923	do	Moncada			11-23-23	2,425.87		2,425.87	[a] Moncada Cadastre, B. L. Case No. 1.
7	Do	do	do	La Paz			12-17-23	3,583.53	3,359.90	6,943.43	[a] La Paz Cadastre, B. L. Case No. 1.
8	Do	do	do	Pura			12-12-23	2,032.48		2,032.48	[a] Pura Cadastre, B. L. Case No. 1.
9	Do	do	do	do			do	1,109.90		1,109.90	[a] Pura Cadastre, B. L. Case No. 2.
20	Proclamation No. 51	S. 1920	Tayabas	Guinayangan (Barrio Piris)	5- 4-22	5-31-22	2-28-23	12,443.73		12,443.73	P640.70
1	Director of Lands	7-12-23	Zambales	Iba	7-29-23	8-30-23	12-29-23	7,833.92	19.20	7,853.12	252.15
1-A	Proclamation No. 4	S. 1923	Zamboanga	Dapitan			11-23-23	214.91		214.91	[a] Dapitan Cadastre, B. L. Cadastral No. 87.
2-A	Do	do	do	Dipolog			do	286.14		286.14	[a] Dipolog Cadastre, B. L. Cadastral No. 85.
4-A	Do	do	do	Lubungan			12-17-23	35.78	1.28	37.06	[a] Lubungan Cadastre, B. L. Cadastral No. 86.
5	Do	do	do	Zamboanga			11-23-23	1,976.67		1,976.67	[a] Zamboanga Cadastre, B. L. Case No. 4.
5-A	Do	do	do	do			do	1,926.81		1,926.81	[a] Zamboanga Cadastre, G. L. R. O. Record No. 8302.
5-E	Do	do	do	do			12-12-23	431.13		431.13	[a] Zamboanga Cadastre, G. L. R. O. Record No. 8196.
5-F	Do	do	do	do			12-17-23	926.61	32.20	958.81	[a] Zamboanga Cadastre, G. L. R. O. Record No. 8267.

[a] No expenses given covering field work, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

Statement of land classification projects certified during the year 1923—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable or disposable	Forest zone	Total		
5-G	Proclamation No. 4	S. 1923	Zamboanga	Zamboanga			12-17-23	89.94	205.31	265.25	[a]	Zamboanga Cadastre G. L. R. O. Record No. 8267.
5-H	Do	do	do	do			11-23-23	1,954.53		1,954.53	[a]	Zamboanga Cadastre, G. L. R. O. Record No. 8695.

[a] No expenses given covering field work, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

Statement of land classification projects pending on December 31, 1923

Project No.	Requested		Regions		Field work		Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed	Alienable or disposable	Forest zone	Total		
1	Director of Forestry	2-27-23	Apayao	Tawit	3-14-23	3-23-23	1,113.00	125.00	1,238.00	₱360.84	Pending compilation.
2	Do	do	do	do	6-10-23	6-10-23	290.00	8.50	298.50	87.44	Do.
1	Proclamation No. 65	S. 1920	Cagayan	Gattaran	3-14-23	3-23-23	100.00	32.00	132.00	37.81	Do.
2	Do	do	do	do	do	do	158.00		158.00	46.56	Do.
12	Do	do	do	Calayan	6-30-23	7-13-23	2,981.20	12,836.40	15,817.16	46.80	Do.
	Lieutenant-Governor of Catanduanes.	10-20-22	Catanduanes	All							Do.
5	Proclamation No. 4	S. 1923	Cebu	Cebu							Cebu Cadastre, B. L. Case No. 2. Pending report.
6	Do	do	do	Carcar							Carcar Cadastre, B. L. Case No. 1. Pending report.
	Do	do	do	do							Carcar Cadastre, B. L. Case No. 3. Pending report.
9	Proclamation No. 67	S. 1920	Cotabato	Parang	5-20-23	9-16-23	10,771.20		10,771.20	178.47	Pending compilation.
10	Do	do	do	Buldon	do	do	5,744.80		5,744.80	110.18	Do.
12	Do	do	do	Awang (Libungan)	do	do	744.80		744.80	113.60	Do.

32	Do	do	do	Dulauan	10-29-22	11-19-22	28,693.12	770.63	29,463.75	303.76	Dulauan Cadastre, B. L. Cadastral No. 107. Pending compilation.
33	Do	do	do	Cotabato, Awang, and Lebak.	9- 6-22	9-27-22	13,024.40	1,382.00	14,406.40	276.14	Pending compilation.
34	Do	do	do	Awang	10- 4-22	10- 9-22	2,997.20		2,997.20	82.84	Burungutan Valley. Pending compilation.
35	Do	do	do	Lebak	6- 1-23	6-14-23	930.90		930.90		Expenses charged to Port Lebak Forest Reconnaissance. Pending compilation.
36	Do	do	do	do	do	do	376.90		376.90		Do.
2	Do	do	Davao	Guianga	4-11-23	4-27-23	29,268.54	541.00	29,809.54	197.03	Guianga Cadastre, B. L. Cadastral No. 174. Pending compilation.
3	Do	do	do	Tugbok	3-12-23	4-10-23	60.80		60.80		Expenses included in Davao project No. 1. Pending compilation.
4	Do	do	do	Guianga	4-30-23	5- 6-23	12,560.00		12,560.00	81.13	Outside of B. L. Cadastral No. 174. Pending compilation.
5	Do	do	do	Santa Cruz	5- 7-23	6-19-23	45,470.00	400.00	45,870.00	150.67	Pending compilation.
6	Do	do	do	Malita	6-20-23	8- 3-23	40,170.00	190.00	40,360.00	498.37	Do.
7	Do	do	do	Lupon	8- 7-23	8-14-23	9,750.00		9,750.00	92.72	Do.
8	Do	do	do	Pantukan	8-15-23	9- 6-23	10,900.00		10,900.00	255.16	Do.
9	Do	do	do	Mati	4-18-23	7- 3-23	12,460.00		12,460.00	88.77	Do.
29	Proclamation No. 4 S. 1923		Iloilo	Calinog							Calinog Cadastre, B. L. Case No. 1. Pending inspection.
31	Do	do	do	do							Calinog Cadastre, B. L. Case No. 3. Pending inspection.
1	Director of Lands 5-9-23		Laguna	Santa Cruz							Pending inspection.
1	Proclamation No. 67 S. 1920		Lanao	Sagiaran, Bakulud, Marantau, Uatu, and Tugaya.							B. L. Cadastral No. 63. Pending report.
2	Do	do	do	Bakulud, Madalun, Munni, Ganassi, and Pulas.							B. L. Cadastral No. 83. Pending inspection.
3	Do	do	do	Binadayan, Bayan Landing, Lalapung, and Lambatan.							B. L. Cadastral No. 91. Pending inspection.
11	Do	do	do	Malabang	7-18-23	7-21-23	11,356.00		11,356.00	241.98	Pending compilation.
36	Do	do	do	Tamparan							B. L. Cadastral No. 111. Pending inspection.

Statement of land classification projects pending on December 31, 1923—Continued

Project No.	Requested		Regions		Field work		Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed	Alienable or disposable	Forest zone	Total		
1	Proclamation No. 4	S. 1923	Leyte	Tacloban							Tacloban Cadastre, B. L. Case No. 2. Pending inspection.
21	Director of Forestry	2-20-22	Masbate	Aroroy	2-28-22	7-15-22					Additional field work in progress.
1	Proclamation No. 63	S. 1920	Mindoro	Naujan	3-10-23	5-31-23	11,132.80	1,494.80	12,627.60	219.80	Pending compilation.
3	Do	do	do	Pola	3- 3-23	6-27-23	15,347.17	552.58	15,899.75	210.23	Do.
4	Do	do	do	Pinamalayan	4-28-23	5-15-23	15,814.75	21.00	15,835.75	160.22	Do.
6	Do	do	do	Bongabon	3- 3-23	6-27-23	24,738.32		24,738.32	56.90	Do.
7	Do	do	do	do	do	do	2,714.00	170.00	2,884.00	42.50	Do.
8	Do	do	do	Bulalacao	do	do	6,424.00	265.00	6,689.00	52.53	Do.
9	Do	do	do	San Jose	do	do	17,950.50	1,543.50	19,494.00	154.72	Do.
1	Resolution No. 30, Municipal Council.	S. 1923	Misamis	Gingoog							Pending inspection.
12	Proclamation No. 4	do	Occidental Negros.	La Carlota							La Carlota Cadastre, G. L. R. O. Record No. 72. Pending inspection.
19	Do	do	do	Himamaylan							Himamaylan Cadastre, B. L. Case No. 2. Pending inspection.
7	Proclamation No. 64	S. 1920	Nueva Vizcaya	Bagabag	7- 6-23	7-21-23				34.50	Sitio Pinagpagan. Pending compilation.
1	Director of Forestry	2- 2-22	Pangasinan	Umingan	12- 8-22	12-13-22	2,228.00		2,228.00	318.00	East of Umingan-Lupao Road. Pending compilation.
1	Do	10-19-22	Tayabas	Laguimanoc	10-23-22	7- 5-23	3,813.00	1,553.25	5,366.25	310.15	Pending compilation.
2	Resolution No. 95, Municipal Council.	S. 1923	do	Unisan	do	do	4,735.00	3,242.50	7,977.50	459.96	Do.
2-A	Do	do	do	do	7-13-23	11-22-23	6,860.00	460.00	7,320.00	108.43	Do.
3	Director of Forestry	10-19-22	do	Atimonan	10-23-22	7- 5-23	11,465.00	6,687.50	18,152.50	1,041.68	North and west of railroad line. Pending compilation.
4	Resolution No. 115, Municipal Council.	S. 1923	do	Mauban	do	do	7,025.00	9,255.00	16,280.00	940.22	South of Sampaloc-Mauban Road. Pending compilation.
5	Director of Forestry	10-19-22	do	Sampaloc	do	do	1,330.00	1,452.50	2,782.50	160.34	South of Lucban and Mauban Road. Pending compilation.

6	Do	do	do	Lucban	do	do	2,320.00	3,175.00	5,495.00	315.81	East of Tayabas-Lucban-Sampaloc Road. Pending compilation.
7	Do	5-2-23	do	Lopez	5-18-23	7-12-23	23,710.00	5,940.00	29,650.00	435.41	Pending compilation.
8	Resolution No. 67, Municipal Council.	S. 1922	do	Gumaca	7-13-23	11-22-23	15,860.00	4,980.00	20,840.20	305.86	Do.
9	Director of Forestry	5-2-23	do	Pitogo	do	do	8,570.00	280.00	8,850.00	131.76	Do.
10	Do	10-19-23	do	Atimonan	do	do	920.00	140.00	1,060.00	16.88	South and east of the railroad line. Pending compilation.
12	Do	5-25-23	do	Casiguran and Calabgan.	5-31-23	7-30-23	10,817.00	24,183.00	35,000.00	276.80	Pending compilation.
13	Do	10-8-23	do	Macalelon	7-13-23	11-22-23	2,180.00	240.00	2,420.00	36.68	West of Macalelon-Bantad River. Pending compilation.
15	Resolution No. 46, Municipal Council.	S. 1922	do	San Narciso							Pending inspection.
17	Resolution No. 9, Municipal Council.	S. 1921	do	Quezon	6- 8-23	8- 7-23	7,000.00	2,192.00	9,192.00	373.35	Pending compilation.
18	Director of Forestry	5-31-23	do	Alabat	8- 8-23	9-25-23	12,051.00	2,592.00	14,643.00	214.79	Do.
19	Resolution No. 91, Municipal Council.	S. 1922	do	Polillo	10-18-23	11-25-23	3,873.60		3,873.60	228.32	Do.
21	Director of Forestry	10-19-22	do	Pagbilao	10-23-22	7- 5-23	6,158.00	7,878.25	14,036.25	805.56	Do.
22	Do	10-8-23	do	Macalelon	10-26-23	11-19-23	10,000.00	9,000.00	19,000.00	34.60	East of Macalelon-Bantad River. Pending compilation.
23	Do	do	do	Catanauan	11-20-23	12-18-23	13,260.00	6,740.00	20,000.00	60.30	Pending compilation.
26	Director of Lands	4-24-22	do	Tayabas	9-16-22	11-27-22				167.14	B, L. Cadastral No. 140. Pending compilation.
1	Proclamation No. 67	S. 1920	Zamboanga	Dapitan							Pending inspection.
2	Do	do	do	Dipolog							Field work in progress.
4	Do	do	do	Lubungan							Do.
5	Do	do	do	Zamboanga	5-28-23	6-20-23	6,813.85	7,710.00	14,523.85	230.01	Zamboanga Cadastre, B. L. Case No. 1. Pending compilation.
5-A	Do	do	do	do	9- 1-23	9-18-23	10,481.88	2,381.00	12,862.88	179.60	Zamboanga Cadastre, B. L. Case No. 2. Pending compilation.
16	Do	do	do	Sindangan							Field work in progress.
18	Do	do	do	Taluksangay	10-17-23	10-22-23	1,625.00	2,198.00	3,823.00	82.40	Sacol Island. Pending compilation.

NOTE.—The areas of classified regions are calculated.

Statement of land classification projects certified to the Bureau of Lands since the enactment of the new public land law on November 29, 1919, to December 31, 1923

Provinces	Before 1923		During 1923		Total	
	Number of projects	Area in hectares	Number of projects	Area in hectares	Number of projects	Area in hectares
Abra						
Agusan	1	42,265.80			1	42,265.80
Albay-Catanduanes			2	791.16	2	791.16
Antique						
Bataan			6	15,914.03	6	15,914.03
Batanes						
Batangas			2	2,235.37	2	2,235.37
Bohol						
Bukidnon			1	2,488.40	1	2,488.40
Bulacan						
Cagayan			1	220,074.00	1	220,074.00
Camarines Norte	1	6,022.00			1	6,022.00
Camarines Sur	1	33,809.00			1	33,809.00
Capiz						
Cavite			2	65.09	2	65.09
Cebu			7	5,129.91	7	5,129.91
Cotabato			13	39,544.87	13	39,544.87
Davao			1	33,194.11	1	33,194.11
Ilocos Norte			5	890.96	5	890.96
Ilocos Sur						
Iloilo			29	35,892.12	29	35,892.12
Isabela			2	254,645.00	2	254,645.00
Laguna			2	2,892.84	2	2,892.84
Lanao			2	44,397.00	2	44,397.00
La Union			2	7,591.80	2	7,591.80
Leyte	3	38,200.00	1	18.88	4	38,218.88
Marinduque						
Masbate						
Mindoro	2	45,579.00			2	45,579.00
Misamis			1	7,277.00	1	7,277.00
Mountain Province:						
Apayao			1	20,520.00	1	20,520.00
Benguet						
Bontoc						
Ifugao						
Kalinga			1	7,632.00	1	7,632.00
Nueva Ecija	3	19,301.31	38	295,809.23	41	315,110.74
Nueva Vizcaya	1	31,740.00	7	24,339.27	8	56,079.27
Occidental Negros	2	55,149.00	15	211,259.52	17	266,408.52
Oriental Negros	1	6,025.00	2	1,481.89	3	7,506.89
Palawan			4	4,726.09	4	4,726.09
Pampanga			9	43,937.00	9	43,937.00
Pangasinan			25	20,667.51	25	20,667.51
Rizal			5	2,148.14	5	2,148.14
Romblon						
Samar	1	9,820.00			1	9,820.00
Sorsogon	1	1,616.00			1	1,616.00
Sulu						
Surigao						
Tarlac			9	42,032.97	9	42,032.97
Tayabas	2	48,537.00	1	12,443.73	3	60,980.73
Zambales			1	7,853.12	1	7,853.12
Zamboanga			9	8,051.31	9	8,051.31
Total	19	328,064.31	206	1,375,944.32	225	1,714,008.63

PUBLIC LAND APPLICATIONS

In accordance with the arrangement made between the Bureaus of Lands and Forestry during the latter part of 1922, the Bureau of Forestry continued during the year to examine all public land applications received and dated prior to November 29, 1919, applications in the provinces open for disposition under the new land law, and those applications which, in the

opinion of the Director of Lands, cannot be definitely identified within the area already classified and certified. In addition to the ordinary land classification, the Bureau of Lands refers to this Office for certification all applications for free patent which, upon ocular inspection by its field men, turn out to be for mangrove swamps or land subject to the forest regulations, or which affect the right-of-way for the extraction of forest products from the public forests.

During the year, 15,143 parcels of public lands were certified as compared with 3,348 in 1922. There are pending for inspection 2,753 applications against 14,193 of the previous year. Detailed statements will be found in Appendix No. 1.

PUBLIC FOREST LAND CASES

This Division has consistently followed the policy adopted in the past years of presenting opposition to the perfecting of titles in the Courts to forest lands subject to the provisions of section 1820 of the Administrative Code.

As can be seen in the table following, there have been received in this office during the year from the General Land Registration Office notices of hearing of 89 cadastral cases and 1,630 ordinary cases. After a careful study of the forest data in the record of this office, and actual examination on the ground of the parcel of land in question, oppositions to the registration of 51 cadastral cases and 25 ordinary cases were presented. Owing to the limited time between the date set for the trial of a case and the date upon which notice of hearing is received, this office was obliged to enter opposition, as has been in the past, to the registration of tracts of land of doubtful nature as a safeguard measure. Investigations are later on made and oppositions are withdrawn or sustained as the case may be. This procedure works hardship to the Courts, Fiscals, and the owners, not to mention the inconveniences it causes this Bureau in disorganizing and suspending important work so as to attend to the rush demands of those hearings. It is believed that these weak points cannot be obviated until there is a better understanding and coöperation between this Bureau and other Government branches concerned with the land registration.

Ninety-nine (99) land registration cases, with a total area of 469,589.7689 hectares, were inspected during the year 1923, as compared with 124 cases with an aggregate area of 245,840.0995 hectares during the year 1922. Although there is a decrease in the number of cases inspected, yet there is a marked increase in the amount of work performed during the

year over any of the previous years. This difference is due principally to the fact that the number of cases received during the year, although less in number, yet cover a very much bigger area. It should be noted in this connection that there have been 178 cases sent for inspection, of which 79 cases were still pending inspection and report on December 31, 1923. Out of the 79 pending cases, 70 are not as yet scheduled for hearing in the court, and consequently, the necessary action has been left in abeyance. Tabular statement of these cases here follows:

Table showing the status and number of ordinary and cadastral cases received and pending during the year 1923

	Ordinary			Cadastral			Total		
	Number of cases	Number of lots	Area in hectares	Number of cases	Number of lots	Area in hectares	Number of cases	Number of lots	Area in hectares
Cases pending hearing on December 31, 1922	28	83	1,787.0316	36	25,797	190,982.1489	64	25,880	[a] 192,769.1805
Cases received from G. L. R. O	1,630	2,817	12,746.1579	89	77,330	382,977.1660	1,719	80,147	395,723.3239
Cases acted upon although not scheduled for hearing in 1923				70	80,250	141,141.6740	70	80,250	141,141.6740
Total number of cases handled during 1923	1,658	2,900	14,533.1895	195	183,377	715,100.9889	1,853	186,277	729,634.1784
Cases pending inspection and report on December 31, 1923	9	31	1,636.9206	70	80,250	141,141.6740	79	80,281	142,778.5946
Cases without opposition	1,624	2,788	9,531.2597	60	49,806	109,371.4758	1,684	52,594	118,902.7355
Cases with opposition	34	112	5,001.9298	65	53,321	464,587.8391	99	53,433	[a] 469,589.7689
Cases opposition withdrawn after inspection	9	16	2,347.9086	14	18,150	81,408.0471	23	18,166	83,655.9557
Cases opposition sustained	25	96	2,764.0212	51	35,171	383,179.7920	76	35,257	[a] 385,843.8132
Cases lost	1	2	5.7524	[b] 2	1,424	10,176.5983	3	1,426	[a] 10,182.3507
Cases won	2	9	313.1267	[c] 22	16,811	260,781.3239	24	16,820	[a] 261,094.4506
Cases pending hearing on December 31, 1923	22	85	2,435.1421	27	16,986	112,221.8698	49	17,021	[a] 116,657.0119

[a] It should be understood that only a portion of the area in these lots is forested.

[b] One of the two cadastral cases lost, involving an area of 517.2875 hectares, was inspected and contested during the year, and the other in the previous year.

[c] Of the 22 cases won, only four cases involving an area of 59,363.8966 hectares were inspected and opposed during the year, the rest having been acted upon in the previous years. It should be understood also that only a portion of this area was excluded as public forest lands, the survey of which is still pending.

FOREST ZONES

In previous years, the establishment of forest zones has been made almost independently of other work on forest regions of permanent character. Since the enforcement, however, of the new Public Land Act, the new procedure for the classification, demarcation, and certification of land made it necessary for this Office to establish forest zones, now legally termed as *timber lands,* simultaneously with the tracts certified as alienable and disposable.

In connection with the land classification projects and certification to the Bureau of Lands during this year, there were established 88 blocks of timber lands with an aggregate area of approximately 73,113.43 hectares. The area of these forest zone blocks is included in the tabular statement on land classification. The following shows by fiscal year the total area of the forest zones established in connection with land classification:

Fiscal year	Area in hectares
1920	10,390.00
1921	11,741.48
1922	2,781.31
1923	73,113.43

There are several land classification projects executed in municipalities whose boundaries have not as yet been definitely established. In these cases, close surveys were made around alienable or disposable areas to be certified to the Director of Lands, leaving the remaining area of timber land as partial forest zone blocks or forest zones of indefinite extent. The following tabulated statement shows the forest zones thus established which, as soon as they can be definitely described by close surveys, will be recommended by this office for proclamation by the Governor-General as timber land under section 6 of Act No. 2874:

Project No.	Province	Municipality	Location of forest zone
22	Agusan	Butuan and Cabadbaran	South of alienable block.
13	Apayao	Ripang, Tauit, Calasitan, Nagbanaggan, and Cagadiongan.	Adjoining Cagayan-Apayao Provincial Boundary.
13	Cagayan	All	Adjoining the provincial boundary.
4	Camarines Sur	Tinambac and Calabanga	Southwest of alienable block.
3	Davao	Tugbok	West of alienable block.
4	Do.	Guianga	Do.
5	Do.	Santa Cruz	Do.
6	Do.	Malita	Do.
7	Do.	Lupon	East of alienable block.
8	Do.	Pantukan	Do.
9	Do.	Mati	West of alienable block.
13	Ilocos Norte	Langangan	Around the alienable block.
1	Isabela	Jones	North, south, and west of alienable block.

Project No.	Province	Municipality	Location of forest zone
13	Do	All	Adjoining the Provincial Boundary.
13	Kalinga	Pinukpuk, Tabuk, and Ripang.	Adjoining Isabela-Kalinga Provincial Boundary.
37	Lanao	Iligan, Mumungan, Kapatagan, and Kolambugan.	Adjoining the provincial boundary.
10	Leyte	Ormoc	Northwest of the alienable block.
2	Mindoro	Bongabon	West of the alienable block.
5	Do	Calapan	Do.
38	Misamis	Misamis	North of the alienable block.
2	Negros Occidental	Pontevedra, B. L. Case No. 2	East of the alienable block.
3	Do	Murcia	Do.
5	Do	Binalbagan	South of the alienable block.
6	Do	Talisay	East of the alienable block.
7	Do	Murcia extension	North of the alienable block.
8	Do	Bacolod	East of the alienable block.
10	Do	Bago, B. L. Case No. 2	Do.
13	Do	Victorias	Do.
14	Do	Saravia	Do.
17	Do	Kabankalan	East and West of the alienable block.
3	Nueva Ecija	Bongabon	East of the alienable block.
9	Do	Santa Rosa	Do.
12	Do	Laur	Remaining jurisdiction except Sabani Estate.
14	Do	Peñaranda	East of the alienable block.
15	Do	Gapan	Do.
36	Do	Carranglan and Pantabangan.	Remaining jurisdiction.
37	Do	Papaya	East of the alienable block.
7	Nueva Vizcaya	Bagabag	All around the alienable block.
12	Do	Bagabag, Solano, Bayombong, and Bambang.	North and West of the alienable block.
13	Do	Regions adjoining Isabela	Adjoining Isabela-Nueva Vizcaya provincial boundary.
1	Palawan	Puerto Princesa	Remaining part of the peninsula east of Irahuan River.
9	Samar	Gandara, Tarangnan, and Catbalogan.	South, east, and northwest of the alienable block.
11	Tayabas	Calauag and Guinayangan	South and east of the alienable block.
14	Do	Baler	North, south, and west of the alienable block.
20	Do	Guinayangan and Piris	Remaining jurisdiction.
1	Zambales	Iba	East of the alienable block.

FOREST RESERVES

There has been no especial work undertaken during the year in the establishment of new forest reserves, as it is planned that no forest reservations will hereafter be recommended for proclamation until the land has been accurately surveyed in accordance with the regulations and standards of the Bureau of Lands. Instead, forest zone blocks already established in regions where this Office intends to carry on intensive forest work in the future will, as a preventive measure, be proclaimed in the meantime as timber land.

As anticipated in the previous annual report, this Office desires to increase its surveying personnel, in order to give impetus to the permanent establisment of forest reserves. The one who has been duly authorized as forest surveyor has already begun the work, but judging from what has been accomplished, it will be impossible for one man to do it alone for many years. It is expected, however, that as soon as the prospective surveyors

of this Office qualify themselves, the work will be given greater attention.

The following is the result of the work accomplished on forest reserves during the fiscal year 1923:

Mount Arayat Forest Reserve.—This reservation was proclaimed on October 14, 1921, before a definite survey had been made and included in the 1921 and 1923 annual reports. On June 7, 1923, the plan of the final survey of the same made by a forest surveyor of this Bureau was submitted to the Bureau of Lands and approved on July 31, 1923. In lieu thereof, a new proclamation, No. 67, dated October 25, 1923, was issued amending Proclamation No. 40, series of 1921.

Mount Banahao and San Cristobal Forest Reserve.—This reservation was proclaimed on October 14, 1921, and included in the 1921 annual report before a final survey was made. So in the middle of 1923, a forest surveyor of this Bureau, duly authorized by the Department Secretary began the final survey of this tract, which work is still in progress.

Mount Bankai Forest Reserve.—This tract covers a low isolated mountain standing in the midst of a vast cultivated plain of Central Luzon situated in the municipality of Cuyapo, Province of Nueva Ecija, and was set aside by virtue of Proclamation No. 66, dated October 20, 1923, for protection of the water flow of the creeks and rivers originating therefrom.

Teak Reservation.—By proclamation No. 52, series of 1923, three parcels of land containing a total area of 1,259,100 square meters were excluded from the teak reservation in barrio Suu, municipal districts of Lati, Panamau, and Gitong, Province of Sulu, Island of Jolo, established under Proclamation No. 42, series of 1918.

Proposed Forest Reserve inside the Balactasan Scientific Center.—The proposed forest reservation consists of 8 blocks containing a total area of approximately 74,482,000 square meters and located inside the proposed civil reservation for educational and scientific purposes in the municipality of Isabela, Island of Basilan, Province of Zamboanga. This reservation was recommended before a definite survey had been made in order to protect the Bureau of Forestry's interest in matters pertaining to forestry, which may be affected by the proclamation of the Balactasan Scientific Center as a civil reservation. This is in view of the importance of the forest resources comprised therein, both from a commercial as well as from a conservation standpoint.

Proposed Masinloc Forest Station Reserve.—This tract was layed out at Port Matalvis, municipality of Masinloc, Province of Zambales, comprising an approximate area of 13,000 square meters, for a permanent forest station site. A request for survey was made to the Bureau of Lands on November 12, 1923.

Proposed Talavera Watershed Forest Reserve.—This tract was established in the latter part of the year 1921 and a description included in the annual report for that year. Due to the importance of reserving this tract at the earliest possible time, Proclamation No. 47, dated August 29, 1923, was issued, classifying the same as timber land. As soon as this tract is finally surveyed, it will be recommended for proclamation as a reserve.

The following is a complete list of all the forest reserves established or proposed up to December 31, 1923, amending the tabular statement referring to the same mentioned in the 1922 annual report which pertains to reserves prior to December 31, 1922:

Title	Province	Date of proclamation
Lamao Forest Reservation [a]	Bataan	Executive Order No. 33, July 26, 1904.
Atimonan Forest Park	Tayabas	Proclamation No. 2, January 28, 1913.
Salinas Forest Reserve	Nueva Vizcaya	Executive Order No. 44, May 18, 1914.
Forbes Forest Park	Benguet	Philippine Commission Resolution No. 119, October 12, 1915.
Limay Forest Station Site	Bataan	Executive Order No. 34, April 11, 1917.
Forest Reservation on coal bearing districts, Polillo Island.	Tayabas	Proclamation No. 31, July 31, 1917.
Forest Reservation on coal bearing districts, Alabat Island.	do	Proclamation No. 31, July 31, 1917.
Teak Reservation [b]	Sulu	Proclamation No. 42, October 31, 1918.
Kolambugan Forest Station Site	Lanao	Executive Order No. 85, December 3, 1919.
The Makiling National Botanic Garden [c]	Laguna and Batangas.	Proclamation No. 60, November 30, 1920.
Western Batan Island Forest Reserve	Albay	Proclamation No. 22, August 6, 1921.
Port Banga Forest Station Site	Zamboanga	Proclamation No. 28, August 27, 1921.
Mount Banahao and San Cristobal Forest Reserve.[d]	Laguna and Tayabas.	Proclamation No. 42, October 14, 1921.
Mount Arayat Forest Reserve [e]	Pampanga	Proclamation No. 42, October 14, 1921.
Busol Forest Reserve	Benguet	Proclamation No. 15, April 27, 1922.
The Cave Forest Reserve	do	Proclamation No. 16, April 27, 1922.
Talavera Watershed Forest Reserve [f]	Nueva Ecija	Proclamation No. 47, August 29, 1923.

[a] Amended by Proclamation No. 8, July 12, 1919, excluding certain agricultural portions of the reserve for public use.

[b] Amended by Proclamation No. 52, series of 1923, excluding three parcels of land containing a total area of 1,259,100 square meters.

[c] Formerly designated as Makiling Forest Reserve under Proclamation No. 106, series of 1910.

[d] An accurate survey of this reserve is in progress.

[e] Amended by Proclamation No. 67, October 25, 1923, revising the boundaries as defined in the old proclamation.

[f] Proclaimed as timber land, to be recommended as forest reserve as soon as an accurate survey of same is made.

Title	Province	Date of proclamation
Mount Bankai Forest Reserve	Nueva Ecija	Proclamation No. 66, October 20, 1923.
Talisay-Minglanilla Forest Reserve [g]	Cebu	
Northern Negros Forest Reserve [g]	Occidental Negros	
Forest Reserve for the Manila Railroad Company along the Calauag-Aloneros railroad line. [g]	Tayabas	
Pagsanjan Gorge National Park [g]	Laguna	
Mount Amorong Forest Reserve [g]	Nueva Ecija and Pangasinan.	
Mount Bulaylay Forest Reserve [g]	Nueva Ecija	
Northern Masbate Forest Reserve [g]	Masbate	
Naga-naga Forest Station Site [h]	Zamboanga	
Reserve for the protection of mangrove swamps (10,000 hectares) in the Municipalities of Dumangas, Barotac Nuevo, and Banate. [i]	Iloilo	
Masinloc Forest Station Site [j]	Zambales	

[g] Preliminary examination and survey finished to be recommended for proclamation.
[h], [i], [j] Request made for survey to the Director of Lands on April 25, 1918, July 22, 1918, and November 12, 1923, respectively, are pending proclamation for lack of technical description.

PRIVATE WOODLAND REGISTRATION CASES

In accordance with section 1829 of the Administrative Code, 29 certificates of forest registration covering 40 parcels of land with a total area of 12,078 hectares, 35 ares, and 75 centares, have been issued during the year, of which 1,727 hectares, 28 ares, and 57 centares are highland forest, and 217 hectares, 36 ares, and 12 centares are mangrove swamps, showing a considerable increase over the previous year. Aside from these, there were issued 26 provisional certificates of forest registration covering 49 parcels of land with a total area of 8,863 hectares, 75 ares, and 82 centares.

The total area covered by the provisional and proper certificates of forest registration issued in 1923 is 18,200 hectares, 61 ares, and 61.97 centares more than in the preceding year.

In addition to the above, this Division challenged 549 claimants of private forest lands which, according to report of forest officers, are located within proposed and established forest zones, communal forests and areas applied for by prospective forestry licensees. They were requested to submit their titles or documents evidencing their rights thereto in accordance with section 1829 of the Administrative Code, either for the purposes of registration in this Bureau, or to enable this Office to determine whether such claimed lands are a part of the public forests under section 1820 of the same code. Of these new claims, plus 316 claims challenged and pending at the end of the year 1922, making a total of 865, 376 were rejected and declared for administrative purposes as a part of the public forest and 83 were considered as entitled to the benefits of either section 41 or 45 (*b*) of Act No. 2874, or section 1513 of the

Administrative Code, leaving a total of 459 claims with final action at the end of the year. Therefore, there were 406 claims pending at the end of the year as compared with 316 claims of the previous year. This is caused by the fact that the corresponding claimants failed to comply with our request. Besides, this Office has been greatly handicapped in sending tracers on account of the lack of clerical force. Some of these tracers have been unnecessarily delayed from two to six months, whereas, under ordinary circumstances, they should have been attended to within one month from the time that a particular claimant was challenged.

Considering the limited personnel engaged in this line of work and the pressure of the work of this Bureau, the work accomplished in private woodland registration cases is gratifying.

The following table shows the private woodland registered up to December 31, 1923:

Calendar year—	Number of—			
	Parcels	Hectares	Ares	Centares
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,115	86	62
1910	4	8,653	85	22
1911	5	5,533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
1917	48	7,985	68	39
1918	84	43,213	17	26
1919	110	14,943	71	39
1920	41	47,723	82	90
1921	53	11,552	48	87
1922	44	3,493	81	54
1923	40	12,078	35	75
Total	1,278	455,494	33	04

COMMUNAL FORESTS

In accordance with section 1839 of the Administrative Code, 100 new parcels of communal forests, with a total area of 11,912 hectares, were established this year as compared with 214 parcels, with a total area of 21,245 hectares, for 1922. Considering the limited number of men available to carry on this work, it having been the policy adopted during the year to concentrate the efforts of this Division in land classification projects, the result is highly gratifying.

The following is a complete statement of the work accomplished and the status of pending work on communal forests at the end of the year:

Number of parcels pending on December 31, 1922	122
Number of parcels requested for establishment in 1923	123
Total	245
Number of parcels proclaimed in 1923	54
Number of parcels pending survey and report on December 31, 1923	149
Number of parcels reported but pending final action in the central office	87
Number of parcels surveyed but report pending	16

The total number of communal forests now amounts to 1,125 distributed among the different provinces as shown in the following table:

Statement of communal forests established up to December 31, 1923

Provinces	Parcels established		Total parcels established up to 1923	Municipalities and municipal districts			Cancelled	
	Before 1923	During 1923		With communal forests	Without communal forests	Area in hectares of parcels established up to 1923	Parcels	Hectares
Abra	32	.....	32	18	21	6,110.00	1	316.00
Agusan	6	.....	6	4	54	946.00	.....	.....
Albay-Catanduanes[a]	38	3	41	18	5	3,335.00	5	574.00
Antique	6	.....	6	6	7	1,406.00	.....	.....
Bataan	17	.....	17	12	.....	5,141.40	2	464.00
Batanes	.....	.....	.....	.....	6	.....	.....	.....
Batangas	2	.....	2	1	24	136.00	.....	.....
Bohol	41	8	49	31	5	6,675.80	.....	.....
Bukidnon	1	.....	1	1	11	620.00	.....	.....
Bulacan	3	.....	3	3	21	500.16	1	232.16
Cagayan[a]	47	7	54	22	3	7,251.60	5	590.00
Camarines Norte	8	.....	8	7	2	1,171.00	.....	.....
Camarines Sur	46	5	51	28	3	5,845.90	1	175.00
Capiz	33	3	36	17	3	3,329.00	1	88.00
Cavite	1	.....	1	1	19	252.00	.....	.....
Cebu	26	9	35	17	34	2,333.80	.....	.....
Cotabato	.....	.....	.....	.....	32	.....	.....	.....
Davao	10	1	11	4	19	1,242.00	.....	.....
Ilocos Norte	26	2	28	16	14	10,145.00	5	1,612.00
Ilocos Sur	39	5	44	31	26	8,393.00	3	3,160.00
Iloilo	17	6	23	13	22	2,544.00	2	596.00
Isabela	20	2	22	14	13	3,765.00	2	176.00
Laguna	16	.....	16	11	17	2,252.00	.....	.....
Lanao	3	.....	3	2	36	1,053.00	2	800.00
La Union	21	2	23	21	12	6,451.00	2	650.00
Leyte	77	6	83	33	13	7,745.00	1	85.60
Marinduque	12	.....	12	4	2	1,672.00	.....	.....
Masbate	28	2	30	8	.....	2,021.00	1	80.00
Mindoro	21	5	26	10	9	2,747.00	.....	.....
Misamis	23	3	26	15	40	3,840.00	.....	.....

[a] Due to public calamity, the communal forests of Abulug, Ballesteros, Claveria, Pamplona, and Sanchez Mira, Province of Cagayan, were suspended temporarily to December 31, 1923; Calayan, Cagayan, to March 31, 1924; and Baras, Bato, Calolbon, Pandan, Panganiban, Viga, and Virac, Albay, to December 31, 1924, to allow the residents thereof to enjoy, during the period, the privileges granted by section 1840 of the Revised Administrative Code as amended by Act No. 2902.

Statement of communal forests established up to December 31, 1923—Continued

Provinces	Parcels established		Total parcels established up to 1923	Municipalities and municipal districts			Cancelled	
	Before 1923	During 1923		With communal forests	Without communal forests	Area in hectares of parcels established up to 1923	Parcels	Hectares
Mountain Province:								
Apayao	4	.....	4	1	6	606.00	.....	.....
Benguet	5	.....	5	2	10	248.00	.....	.....
Bontoc	1	.....	1	1	17	180.00	.....	.....
Ifugao	2	.....	2	1	5	556.00	.....	.....
Kalinga	.....	.....	.....	.....	13	.....	.....	.....
Nueva Ecija	30	2	32	23	35	6,732.00	2	393.00
Nueva Vizcaya	17	2	19	6	12	3,057.00	.....	.....
Occidental Negros	32	.....	32	14	11	3,633.00	1	240.00
Oriental Negros	21	6	27	18	80	2,208.00	1	76.00
Palawan	.....	7	7	1	15	1,310.00	.....	.....
Pampanga	3	.....	3	3	18	395.00	.....	.....
Pangasinan	54	5	59	35	29	15,384.48	4	1,225.00
Rizal	16	.....	16	9	18	1,339.40	1	76.00
Romblon	10	.....	10	7	2	1,110.00	1	60.00
Samar[a]	63	3	66	34	11	9,293.00	.....	.....
Sorsogon	21	.....	21	13	3	1,758.00	.....	.....
Sulu	.....	.....	.....	.....	29	.....	.....	.....
Surigao	26	3	29	11	20	3,759.00	2	182.00
Tarlac	11	1	12	9	7	2,034.00	1	265.00
Tayabas	62	2	64	21	7	5,862.00	2	366.00
Zambales	22	.....	22	13	.....	4,513.00	.....	.....
Zamboanga	5	.....	5	3	75	400.00	1	9.00
Total	1,025	100	1,125	593	901	162,902.54	50	12,490.76

[a] Due to public calamity, the communal forests of Borongan, Llorente, and Villareal, Samar, were suspended temporarily to December 31, 1923; Dolores, Calbiga, Sulat, Oras, and San Julian, Samar, to December 31, 1924; Santa Rita, Samar, to June 30, 1924; to allow the residents thereof of enjoy, during the period, the privileges granted by section 1840 of the Revised Administrative Code as amended by Act No. 2902.

Statement of communal forests established and cancelled up to December 31, 1923

	Parcels	Hectares
Total number of parcels and hectares established from 1908 to 1923	1,125	162,902.54
Total number of parcels and hectares cancelled in various years	50	12,490.76
Balance in force	1,075	150,411.78

Communal forests established from 1908 to 1923

Year	Parcels	Hectares
1908	19	5,326.00
1909	19	6,609.00
1910	19	5,796.00
1911	53	15,147.60
1912	59	10,957.00
1913	26	3,387.00
1914	45	6,860.00
1915	90	12,129.00
1916	110	15,862.00
1917	83	10,110.00
1918	61	7,704.82
1919	63	10,537.35
1920	69	9,008.85
1921	95	10,322.20
1922	214	21,245.00
1923	100	11,912.00
Total	1,125	162,902.54

MAPPING AND DRAFTING

There has been a marked increase in the work of this section during the year, due greatly to the land classification projects that have been accomplished. Most of the topographical and forest notes were taken in regions which have not been mapped out in the previous years. The taking of trail notes and valuation surveys in connection with the establishment of communal forests, inspection of license areas and special uses, and other cases relating to the administration of public forests, were carried on as in the past years with the purpose of gathering more information for the compilation of forest maps.

The following table shows the number of kilometers of trail notes and hectares of forest surveys made during the year by field force in each district,—the trail notes already received and filed in Manila and those still pending in district offices being shown:

District Number	Received		Pending		Total	
	Kilometers	Hectares	Kilometers	Hectares	Kilometers	Hectares
1	560.43	15.22	463.94	21.28	1,024.37	36.50
2	221.79	2.00	315.66	.....	537.45	2.00
3	73.46	4.00	196.99	.....	270.45	4.00
4	813.96	31.10	805.40	23.78	1,619.36	54.88
5	464.18	20.62	1,724.53	47.45	2,188.71	68.07
6	621.78	28.95	178.20	11.40	799.98	40.35
7	146.06	3.75	121.34	9.60	267.40	13.35
8	688.29	44.34	2,888.99	624.81	3,577.28	669.15
9	387.57	125.27	259.77	57.04	647.34	182.31
10	345.61	23.23	968.51	62.67	1,314.12	84.90
11	300.36	5.30	296.84	206.38	597.20	211.68
12	189.71	11.66	241.92	.....	431.63	11.66
13	474.34	21.58	851.85	15.69	1,326.19	37.27
Total	5,287.54	336.02	9,313.94	1,080.10	14,601.48	1,416.12

Comparative statement of field notes and valuation surveys taken in 1922 and 1923

Year	Received		Pending		Total	
	Kilometers	Hectares	Kilometers	Hectares	Kilometers	Hectares
1922	5,370.43	365.26	3,963.44	191.48	9,333.87	556.74
1923	5,287.54	336.02	9,313.94	1,080.10	14,601.48	1,416.12

There has been a notable decrease in the work of compilation in the Progressive Forest Maps of topographical and forest data taken from various sources. It is noteworthy, however, that 16 maps of land classification projects and 150 of cadastral cases, classified and certified to the Bureau of Lands, were prepared during the year as compared with only 7 land classification maps of the previous year.

The following is a complete statement of the work accomplished in the Drafting Section which shows that, in general, there is a greater volume of work accomplished this year than in the previous years:

	Sheet
Progressive forest maps:	
Scale 1:100,000—1° × 30′ = 45″ × 25″	162
On drawing paper:	
Pending preparation on December 31, 1922	20
Prepared during 1923	3
Pending preparation on December 31, 1923	17
On tracing cloth:	
Pending on December 31, 1922	97
Prepared during 1923	3
Pending on December 31, 1923	94
Scale 1:20,000—10′ × 10′ = 38″ × 38″	1,481
On drawing paper:	
Pending on December 31, 1922	1,358
Prepared during 1923	1
Pending preparation on December 31, 1923	1,357
On tracing cloth:	
Pending preparation on December 31, 1922	1,432
Prepared during 1923	39
Pending preparation on December 31, 1923	1,393
Special maps:	
Communal forest:	
Pending on December 31, 1922	9
Received during 1923	85
Total	94
Completed during 1923	46
Pending on December 31, 1923	48
Land classification:	
Pending on December 31, 1922	3
Received during 1923	52
Total	55
Completed during 1923	16
Pending on December 31, 1923	39
Maps of cadastral cases classified and certified to the Director of Lands during the year 1923	150
Others completed during 1923:	
Forest reserves	2
Forest reconnaissance	0
Forest contract of lease or special permits	2
For opposition against the registration in the court	132
Showing vegetation in color	16
Copies in blue and maduro prints for field force and official uses	5,632
Sold to different entities (₱40.66)	27
Miscellaneous	493

ADMINISTRATIVE DIVISION

GENERAL STATEMENT

The work of this Division involves the general supervision of all the clerical work of the Bureau, the keeping of the efficiency and civil service records of the employees and all general records, the preparation of estimates for the annual appropriation and distribution of same and its accounting, the care of the property, the control of the clerks in the provinces, the upkeep and maintenance of the office building, the supervision of the general section and the general administration of the office, including the preparation of some letters and typewriting of some reports appertaining to other divisions and all those appertaining to its own. This division is also in charge of all correspondence received in this Office for distribution to different divisions of this Bureau and the checking of such letters, reports, etc., as are prepared by other divisions before they are sent out.

While this Bureau is technical, this Division, however, is directly affected by any increase in the technical, or quasi-technical personnel or in the activities of this Bureau, but due to the economy measure which has been strictly adhered to in this office, the personnel in various sections under this division has been overworked, due to the fact that it has not been increased proportionately; hence, the undersigned wishes to request in this connection that due recognition be accorded the clerical personnel of this Bureau in general.

The present salaries paid to the clerks in this Bureau do not hold out much incentive, on account of the fact that they are absolutely disproportionate to the work required of them and the responsibilities they have to assume. As stated, this is a technical Bureau, hence a clerk must remain some time in this office before he can be of the greatest use to this Bureau; but in view of the low salaries allowed them and the lack of any margin for an increase in salary, the result has been a constant change in this class of personnel. The majority of clerks in this Bureau who have remained a number of years in the service are at the present time still drawing very little over the entrance salaries of their grades. It is, therefore, recommended that the salaries as well as the number of clerical personnel be increased.

In the first part of the year 1922, this office was informed that no new appointments or the filling of vacancies were to be made. In compliance with this order, a number of district clerical positions in the provinces were not filled, in spite of

the fact that the appropriation act provided for them. The result of this was most unpleasant, as these positions held vacant were finally eliminated, and the rangers in the district offices in which these clerks were to have been assigned had to perform clerical work to the detriment of their technical work, preventing them, in various instances, from going on field trips, as by doing so they would have had to close their stations. The remaining clerks had to shoulder additional work beyond their capacity. In some cases, however, in order to remedy this situation, rangers and forest guards had to be asked to perform clerical work; but this, in view of their lack of training and because their time was needed in their regular work, did not give good results and should not be allowed to continue. Up to the present time this undesirable condition is still prevailing, as no remedy has been provided for this Bureau, in spite of its request for it.

The Administrative Division of this Bureau has under its control, the following sections, besides having direct supervision over all clerical work of the Bureau:

Accounting, Property, Records, Library and Translating, General Service Sections, and District Clerks.

ACCOUNTING SECTION

During the year this section audited and classified accounts averaging 800 per month. The work of preparing journal vouchers and warrants for reimbursement of expense accounts, salaries of the employees of this Bureau, and payment of miscellaneous receipts is done in this section. This work involves the issuance of about 1,200 warrants per month. This, in all cases, has to be accounted for and journalized in accordance with the ruling of the Insular Auditor. Aside from this, there were also prepared in this section monthly financial reports for the Bureau of Audits and the Department Secretary.

The payment of the salaries and expenses of the forest pensionados at the School of Forestry of the University of the Philippines, is under the care of this section, which in turn charges the University of the Philippines for reimbursement.

Every year the graduates of the School of Forestry are appointed to this Bureau. In March, 1923, 21 graduate rangers were thus assigned. This increase in the force of the Bureau augmented considerably the work of this section, as the field expenses incurred by them have to be audited in this section and accounted for. In spite of this additional work, no additional clerks have been given this section during 1923.

There are 13 big lumber companies in the Islands, which for purpose of administration are required to employ forest guards under the supervision of this Bureau. For this purpose they are required to make deposits with this Office for the payment of the salaries of their guards. This section is in charge of the payment of salaries and expenses of the guards so employed. Reports showing the status of the deposits are made and sent to the respective companies for their information.

Since the licensees are required to make cash bond deposits, the work of this section has further greatly increased. Every year there is a constant increase in the number of licensees. During the year 5,625 new ones were added. Their cash deposits have to be recorded in this Section according to procedure. At the same time there were cash bond deposits which were either forfeited or refunded. The necessary journal vouchers and warrants, therefore, had to be immediately prepared and taken into account. This work, of course, entails a big amount of bookkeeping and correspondence work.

As the appropriation given this Bureau for 1923 was strictly limited, this section had to be very careful to evade any overdraft. A number of memoranda and circular letters advising the field men to exercise utmost economy in the field and office expenses were issued. Every expense account was minutely examined, the result being many disallowances and suspensions involving the writing of letters to the parties affected. In 1923, the ruling of the Insular Auditor concerning payment of expenses became more exacting, and thus the personnel in this section had to exert more effort in fulfilling the requirements.

PROPERTY SECTION

In the early part of 1923, the 21 graduate rangers of the School of Forestry were appointed to this Bureau, but in spite of this, and the additional activities of this Bureau, both in the field and in the office, naturally requiring a greater amount of supplies than heretofore allowed this Bureau, only the amount of ₱31,500 was appropriated for this purpose. This was a serious handicap in the work of this Bureau, for numerous requisitions had to be either cut down to the minimum, or suspended in order to defeat any overdraft in the appropriation authorized for this particular item by the Legislature. In the latter part of the year, however, this Bureau was obliged to request the shifting of the amount of ₱1,500 to avoid any over-

draft and to enable itself to secure supplies which were absolutely needed, and which it had been impossible to secure.

During the current year there were received in this section about 1,600 requisitions from the field officers and Manila Office force. Due to the absence in stock of articles requisitioned at the time, it was necessary to make 2,966 issue vouchers, the originals of which were sent to the Insular Auditor as evidence of the issues from the storeroom. There had been submitted by this office during the year the following regular requisitions: 96 to the Bureau of Supply; 91 to the Bureau of Printing; and 48 to commercial firms direct. Four of the number submitted to the Bureau of Supply were disapproved by the Emergency Board, which alleged that substitutes for the articles wanted could be found among second-hand materials in other offices of the Government. Because of the insistence of the Emergency Board, equipment valued at ₱614.62 was transferred to this Office. The equipment so transferred is invariably in poor condition and is of very little use to the parties needing same.

There have been complaints from the field officers regarding the refusal to give the office equipment desired. The inability to comply with their requests was not due either to inattention or dilatory methods on the part of this office, but was greatly attributed to the present practice of the Emergency Board involving considerable transaction. The present deficiency can be remedied by requesting the proper authority to allot a specified amount for equipment for this office, to be expended solely for this purpose, without the direct intervention of the Emergency Board, except where equipment in excellent state can be transferred to the requisitioning office, without impairing the efficiency of its administration. With this scheme the Bureau may at least at the beginning of the year, make a plan listing the articles to be purchased during the year. The practice at present is not satisfactory, because, when the proper requisition for equipment substantiated by a complete explanation is sent through the routine course, it will either be reduced or disapproved by the Emergency Board with instructions that the articles wanted can be located in other offices. The property clerk of this Bureau has been to different offices thus designated but he has invariably returned to this Bureau with the report that the equipment offered was either in poor condition or condemnable. These are all the obstacles being confronted by this section and until the present regulations of the Board are altered

to the extent of giving a liberal consideration to this office in the purchase of equipment, the best efficiency can never be attained.

During the year there has been received from the provincial forest stations 70 shipments, consisting of botanical materials, seeds, and equipment. This office also dispatched 241 shipments mostly covering supplies and equipment for the field force and survey parties.

Equipment needing repair work was sent promptly to the government shops. The cost of the repairs handled by the Manila Office amounted to ₱700.

COLLECTIONS

The collections made by the cashier of this Bureau during the year 1923, amounted to ₱91,888.90,—₱43,864.24 of which covered bonds deposited with this office for timber and minor forest product licenses as required.

RECORDS SECTION

This section is in charge of all the general records of this Bureau, including distribution of publications, the preparations of personnel lists and applications for leave. All mimeograph work of this Bureau is also handled in this section. The work in this section has increased considerably during the year, due to the increase in the technical personnel and in various activities.

At the beginning of the year, some changes in the personnel of this section took place, and an experienced clerk in this Bureau was made its chief. During the year certain changes in the handling of the work have been inaugurated which have very much improved the service in this section.

The filing system used is similar to that adopted by the United States Forest Service, whereby correspondence received and sent by this Bureau is designated in accordance with the subject matter. Briefing correspondence on cards, which was introduced last year, has proved very helpful in the sense that it makes it easier to locate correspondence already recorded as the cards serve as indices to the correspondence on file.

Mail sent by this Office:	
Registered letters and packages	1,917
Letters sent by ordinary mail including packages, licenses, circulars, forms, and other printed matters	90,759
Telegrams sent by this Bureau	589
Letters delivered by messengers to different Government offices and other parties	7,179
Total	100,444

Received in this Office:

Registered letters	5,021
Registered packages	137
Letters	36,636
Telegrams	543
Reports, working programs, expense accounts, bills, etc	35,237
Printed matter received by ordinary mail	1,367
Total	78,941

MESSENGER SERVICE

This Bureau is only allowed three messengers for the entire service and they are distributed as follows:

One for the general service in the office and two alternately to deliver correspondence from this Bureau to different Bureaus and offices of the Government and outside parties. They also get the mail from and deliver telegrams to the Post Office. This number of messengers is obviously inadequate, as the activities in this office due to increased work have greatly augmented; hence, clerks and chiefs of divisions have to run errands in the office on many occasions for lack of messengers. It is, therefore, earnestly recommended that the number of messengers be increased to at least six.

LIBRARY AND TRANSLATING SECTION

There are received in this section, from foreign countries and from various Government Bureaus, not less than fifty publications monthly which are sent to the various division chiefs. The different articles which are of interest to this Bureau are then catalogued, after which the publications are filed in the Library.

The Library is used not only by the staff of the Bureau and by other Government officials, but is also open to the use of students and lumbermen. The fact that last year over 200 students came to the Bureau for information on forestry matters is an indication that questions relating to forestry matters are arousing interest in the public schools.

Such articles in the local and foreign press as refer directly or indirectly to the activities of the Bureau of Forestry or its personnel, are clipped and conserved in a scrap book.

This section is also in charge of all translating work in the Bureau.

The actual number of books, pamphlets, and periodicals existing in the library of this Bureau are as follows:

Number of bound volumes	562
Number of unbound volumes	85
Number of pamphlets	2,594
Current periodicals	19

RECOMMENDATIONS

Due to the importance of the various items recommended in previous years, and their failure to meet satisfactory solution, they are hereby reiterated as follows:

That to foster forest conservation on a technical basis at least six forest experiment stations be established throughout the Islands.

That to take advantage of fuller utilization and benefit of our forest wealth, as well as to secure a scientific working basis for the work of the Bureau, a forest product laboratory should be provided for the Division of Investigation.

That the legislation affecting communal forests be changed, to give them the status of forest reserves.

That a special fund be appropriated, similar to the Talisay–Minglanilla reforestation fund, to be expended yearly. With the Luzon flood control reports recommending at least ₱30,000 each year for the Agno River reforestation alone, it is recommended that this Bureau be given a minimum of ₱40,000 annually for reforestation work under a special fund.

That adequate provision for the number of teaching staff and equipment of the School of Forestry be urged to the Board of Regents of the University of the Philippines.

That a substantial increase in the number of technical and clerical positions be provided in the Division of Investigation. The increasing volume of research work connected with the School and the division requires the employment of permanent personnel to properly take care of the necessary work on growth measurements, phenological reports, nursery, and plantations.

That a graduate ranger who has shown proficiency in dendrology be sent to the United States to specialize in Dendrology and Taxonomy. The loss of Doctor Merrill from the Bureau of Science necessitates having a specially trained men to take care of the identification of Botanical materials handled by the Bureau.

That a permanent fund, controlled by a committee so authorized, be appropriated for the necessary work in land classification, delimitation, and survey by the Bureaus of Lands and Forestry for a definite period of years.

This work of transcendental importance cannot be carried out efficaciously if the Bureaus of Lands and Forestry will have to depend exclusively upon their ordinary appropriation for such work, taking into account the numerous and varied attentions which have to be covered by the said appropriation. Besides,

the uncertainty of the form and of the total amount which can be secured yearly hinders the said Bureaus from devising a coördinate plan which will avoid duplication of work or its suspension, due to imperative exigencies of other more important business.

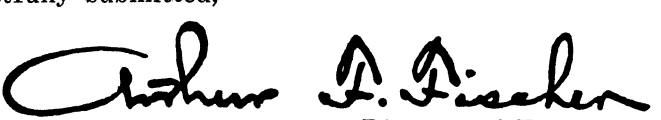
That the salaries of the personnel of the Bureau be placed on the same basis as required in the standardization plan for the personnel of the same or equivalent technical training.

That the personnel, especially the group handling the police and administration work be increased to adequately handle the work and that a permanent corps of forest guards of at least third grade Civil Service rating be allowed.

That an increase of forest surveyors and draftsmen in this Bureau be provided to take care of the increasing volume of work due to recent legislation.

The notably increasing demand for settlement on public lands has made it necessary for this Bureau to adopt a practical method of extensive classification of public lands so as to be able to exclude timber land from the alienable and disposable land under the provisions of the Public Land Act. These timber lands cannot be very well protected until so declared, for which survey and delimitation are necessary. There are likewise a number of private forest lands registered with this Bureau under section 1829 of the Administrative Code, which require delimitation. Many of these private properties contain extensive stands of timber, which necessitates modern methods of steam logging, and due to poor demarcation of their boundaries, the adjoining public forests are subject to encroachment. By increasing the number of qualified forest surveyors, all these can be taken care of and legal surveys effected.

Respectfully submitted,



Director of Forestry

The Honorable
The SECRETARY OF AGRICULTURE AND NATURAL RESOURCES,
Manila.

DIRECTORY OF THE BUREAU OF FORESTRY

ARTHUR F. FISCHER, *Director*

DIVISION OF FOREST MANAGEMENT

Ramon J. Alcarez	Forester, chief.
Antonio P. Racelis	Forester.
Theodore C. Zschokke	Forester.
Nazario Peñas	Forester.
Florencio Tamesis	Forester.
Gregorio Elumir	Ranger.
Manuel Cordero	Forest guard.
Alfredo Catolico	Forest guard.
Aquino R. Leaño	Forest guard.
Carlos Villaruel	Forest guard.
Apolinario Marquez	Forest guard.
Jose Angeles	Junior stenographer.
Ricardo Dizon	Clerk.

SPECIAL PERMIT SECTION

Eladio C. Leaño	Forest supervisor, chief.
Silvino Reyes	Ranger.
Pedro Agaloos	Ranger.
Emilio D. Parreño	Forest guard.
Fausto Pe Benito	Clerk.
Benigno Ongcoy	Clerk.

LICENSE SECTION

Eufemio Santillan	Chief.
Luis S. Mabagos	Clerk.
Arsenio Protacio	Clerk.
Francisco de Asis	Clerk.
Toribio de la Cruz	Clerk.
Claro L. Camba	Clerk.
Emilio Ynabañgan	Clerk.
Eligio Cordero	Clerk.
Gregorio Tayco	Clerk.
Gaudencio Ramirez	Clerk.

STATISTICAL SECTION

Felix Mabbayag	Ranger, chief.
Petronilo Cortes	Ranger.
Raymundo Daza	Ranger.
Ricardo Arafiles	Ranger.
Ignacio Cauagas	Ranger.
Amado B. Parreño	Forest guard.
Severino Buen	Forest guard.
Agapito G. Cahinhinan	Forest guard.

DISTRICT No. 1

[Provinces: Cagayan, Isabela, Mountain Province (Apayao and Kalinga, Subprovinces of), and Batanes]

Forest Station at Aparri, Cagayan (district headquarters):
- Pastor de la Peña — Officer in charge.
- Angel Salazar — Ranger.
- Leonor Lizardo — Ranger.
- Antonio Aloba — Forest guard.
- Felipe T. Pattugalan — Clerk.

Forest Station at Ilagan, Isabela:
- Mamerto C. Azurin — Officer in charge.

Forest Station at Alcala, Cagayan:
- Francisco Siriban — Officer in charge.

Forest Station at Echague, Isabela:
- Vicente Parras — Officer in charge.
- Deogracias Guzman — Ranger.

Forest Station at Claveria, Cagayan:
- Luis Aguilar — Officer in charge.
- Marcelo Fonacier — Forest guard.

DISTRICT No. 2

[Provinces: Ilocos Norte, Ilocos Sur, and Abra]

Forest Station at Vigan, Ilocos Sur (district headquarters):
- Espiritu Paraiso — Officer in charge.
- Francisco L. Rola — Ranger.
- Gregorio F. Navarro — Forest guard.

Forest Station at Bangued, Abra:
- Cayetano Barros — Officer in charge.
- Juan Balbuena — Forest guard.

DISTRICT No. 3

[Provinces: Mountain Province (Benguet, Bontoc, Amburayan, and Lepanto), and La Union (northern part)]

Forest Station at Baguio, Mountain Province (district headquarters):
- Mauricio J. Oteyza — District forester.
- Sixto Laraya — Assistant district forester.
- Robert P. Cortes — Ranger.
- Saquiapao Willie — Ranger.
- Edilberto Madrid — Ranger.
- Pedro Valentin — Ranger.
- Pastor Garcia — Forest guard.
- Godofredo Costales — Forest guard.
- Esteban Fontanilla — Forest guard.
- Francisco Abubo — Forest guard.
- Pedro Gacad — Forest guard.
- Aquilino Balbin — Forest guard.
- Timoteo Lagasca — Forest guard.
- Simon Briones — Forest guard.
- Mariano Fontanos — Forest guard.

DISTRICT No. 4

[Provinces: Pangasinan, Nueva Ecija, Nueva Vizcaya, Tarlac, and La Union (southern part)]

Forest Station at Dagupan, Pangasinan (district headquarters):

Isabelo Achacoso	Officer in charge.
Amando Curaming	Ranger.
Jose B. Logan	Ranger.
Pioquinto de la Vega	Ranger.
Canuto Ducusin	Forest guard.
Victorino Mariano	Forest guard.
Irineo Lopez	Clerk.

Forest Station at San Quintin, Pangasinan:

Juan Acenas	Officer in charge.
Perfecto Adamos	Ranger.
Anselmo Agustin	Forest guard.

Forest Station at Bayombong, Nueva Vizcaya:

Pedro Afalla	Officer in charge.
Andres Tuquiero	Forest guard.

DISTRICT No. 5

[Provinces: Batangas, Tayabas, Laguna, and Marinduque]

Forest Station at Los Baños, Laguna (district headquarters):

Felix Franco	District forester.
Severo Oliveros	Ranger.
Alberto Villanueva	Ranger.
Moises Montalbo	Forest guard.
Isabelo M. Alviar	Forest guard.
Mariano Cenabre	Forest guard.
Eusebio I. Villanueva	Forest guard.

Forest Station at Calauag, Tayabas:

Braulio Cristobal	Officer in charge.
Felix Dayao	Forest guard.
Marciano N. Victoria	Forest guard.

Forest Station at Infanta, Tayabas:

Jose Medina	Officer in charge.
Juan M. America	Forest guard.

Forest Station at Laguimanoc, Tayabas:

Pedro P. Lasquety	Officer in charge.
Leopoldo Miciano	Forest guard.

Forest Station at Mauban, Tayabas:

Crispino Tansioco	Officer in charge.

Forest Station at Kabibihan, via Aloneros, Tayabas:

Gregorio Miras	Officer in charge.
Valeriano Suarez	Ranger.
Castro S. Castillo	Forest guard.
Cayetano Gamalinda	Forest guard.

DISTRICT No. 6

[Provinces: Albay, Camarines Sur, Camarines Norte, Catanduanes, and Sorsogon]

Forest Station at Naga, Camarines Sur (district headquarters):
- Porfirio San Buenaventura — Officer in charge.
- Filemon Kapuno — Ranger.
- Luis Batica — Ranger.
- Gregorio Cristobal — Ranger.
- Eulogio Gines — Forest guard.
- Fermin Sol — Forest guard.
- Agapito M. Borja — Forest guard.

Forest Station at Mercedes, Camarines Norte:
- Jesus O. Duran — Officer in charge.
- Pedro Aduviso — Ranger.
- Sebastian Borja — Forest guard.

Forest Station at Sorsogon, Sorsogon:
- Numeriano Valencia — Officer in charge.
- Alejandro Eguarras — Forest guard.

Forest Station at Catabañgan, via Guinayañgan, Tayabas:
- Macario Simeon — Officer in charge.
- Vedasto Rafa — Forest guard.

Forest Station at Legaspi, Albay:
- Gregorio J. Labitag — Officer in charge.
- Inocencio Ramirez — Ranger.

Forest Station at Virac, Catanduanes, Albay:
- Ramon Mataya — Officer in charge.

DISTRICT No. 7

[Provinces: Antique, Capiz, Iloilo, Occidental Negros, and Romblon]

Forest Station at Cadiz, Occidental Negros (district headquarters):
- Jose B. Hirro — Officer in charge.
- Pedro Gimeno — Ranger.
- Aquilino Porciuncula — Ranger.
- Roman Amor — Ranger.
- Vicente Zosa — Ranger.
- Gregorio Poblacion — Ranger.
- Fausto Flores — Ranger.
- Enrique Alviar — Ranger.
- Teodoro Oliveros — Forest guard.
- Mansueto Olaira — Forest guard.
- Arsenio B. de los Reyes — Forest guard.
- Joaquin Herman — Forest guard.

Forest Station at Asia, Iloilo:
- Andres Masias — Officer in charge.

Forest Station at Ilog, Occidental Negros:
- Maximino Rondario — Officer in charge.

Forest Station at Fabrica, Occidental Negros:
- Juan S. Versoza — Officer in charge.
- Balbino Viado — Ranger.
- Florencio M. Songco — Ranger.
- Miguel Eugenio — Ranger.

Forest Station at Fabrica, Occidental Negros—Continued.

Ruperto Yzarri	Forest guard.
Francisco Diaz	Forest guard.
Nicanor M. Bintad	Forest guard.
Ambrosio Canilao	Forest guard.
Fausto Ejercito	Forest guard.
Severino E. Lovero	Forest guard.

Forest Station at New Washington, Capiz:

Evaristo Tabat	Officer in charge.
Manuel Tupas	Ranger.

DISTRICT No. 8

[Provinces: Zamboanga (except northern part), Sulu, Cotabato, and Davao]

Forest Station at Zamboanga, Zamboanga (district headquarters):

James R. Gillis	District forester.
Celestino Gomez	Ranger.
Prudencio Florita	Ranger.
Quirino Ruiz	Ranger.
Teodoro Tecson	Ranger.
Pedro F. Aguilar	Forest guard.
Isabelo V. Ostrea	Forest guard (Port Holland, Zamboanga).
Julio Brillantes	Clerk.

Forest Station at Cotabato, Cotabato:

Florencio Asiddao	Officer in charge.
Cayetano Macaraeg	Ranger (Port Lebak, Cotabato).
Cecilio Rola	Ranger.
Juan S. Biscayno	Forest guard.
Manuel San Luis	Forest guard (Port Lebak, Cotabato).

Forest Station at Naga-naga, Zamboanga:

Santiago Babaran	Officer in charge.
Gregorio L. Dagang	Ranger.
Zoilo A. Zambrano	Ranger.
Nicolas O. Luna	Forest guard (Olutanga).

Forest Station at Port Bañga, Zamboanga:

Jose Makil	Officer in charge.

Forest Station at Davao, Davao:

Sixto Babao	Officer in charge.
Lorenzo Logan	Ranger.

Forest Station at Mati, Davao:

Juan C. Andrada	Officer in charge.

Forest Station at Jolo, Sulu:

Juan Corales	Officer in charge.

Forest Station at Margosatubig, Zamboanga:

Bonifacio Perez	Officer in charge.
Norberto Denoga	Ranger (Flecha Pt., Zamboanga).
Roman Guerrero	Forest guard.

DISTRICT No. 9

[Province: Palawan]

Forest Station at Puerto Princesa, Palawan (district headquarters):
- Mauro Ablaza — Officer in charge.
- Cornelio Miguel — Ranger.

Forest Station at Balabac, Palawan:
- Simplicio Aguilar — Officer in charge.

Forest Station at Oton, Taytay, Palawan:
- Benito L. Roque — Officer in charge.

DISTRICT No. 10

[Provinces: Leyte (eastern half), Samar, Surigao, and Masbate]

Forest Station at Tacloban, Leyte (district headquarters):
- Adriano V. Santos — Officer in charge.
- Agustin P. Angeles — Ranger.
- Lorenzo Diaz — Ranger.
- Perfecto Tomeldan — Ranger.
- Pastor M. Masangkay — Forest guard.
- Jose Sydiongco — Forest guard.
- Procopio Baltazar — Forest guard.

Forest Station at Catbalogan, Samar:
- Ptolomeo Causing — Officer in charge.
- Potenciano Lucero — Forest guard.

Forest Station at Laoang, Samar:
- Emeterio Edmilao — Officer in charge.
- Pelagio Alemania — Forest guard.

Forest Station at Masbate, Masbate:
- Jose G. Pacis — Officer in charge.
- Florentino C. Versoza — Ranger.
- Rufo Rondilla — Forest guard.

Forest Station at Surigao, Surigao:
- Leon Rojas — Officer in charge.
- Simon Montero — Ranger.

DISTRICT No. 11

[Provinces: Cavite, Rizal, Pampanga, Bulacan, Bataan, and Zambales]

Forest Station at Manila (district headquarters):
- Clemente Mariano — Officer in charge.
- Pedro Gañgan — Ranger.
- Vicente J. Defensor — Ranger.
- Cipriano Domingo — Forest guard.
- Eugenio Mendoza — Clerk.

Forest Station at Arayat, Pampanga:
- Ambrosio Galisim — Officer in charge.
- Simeon C. Fabie — Forest guard.

Forest Station at Limay, Bataan:
- Fausto Alambra — Officer in charge.
- Emilio Fabila — Forest guard (Balanga).
- Hilario Borromeo — Forest guard (Almacen).
- Teodoro Mgalindan — Forest guard (Balanga).

Forest Station at Subic, Zambales:
- Pedro Montero — Officer in charge.
- Marcial Agayan — Forest guard.

Forest Station at Masinloc, Zambales:
- Valentin Sajor — Officer in charge.
- Valeriano V. Elgincolin — Forest guard.

Forest Station at Paysawan, Bagac, Bataan:
- Vicente J. Villaflor — Officer in charge.
- Marcelo Udarbe — Ranger.
- Primitivo Baluyot — Forest guard.
- Deogracias F. Agustin — Forest guard.
- Fermin Quijano — Forest guard.

Forest Station at Norzagaray, Bulacan:
- Andres Bernardo — Officer in charge.

DISTRICT No. 12

[Province: Mindoro]

Forest Station at Calapan, Mindoro (district headquarters):
- Cornelio Nable Jose — Officer in charge.
- Eusebio Leuterio — Ranger.

Forest Station at San Jose, Mindoro:
- Leoncio Rebong — Officer in charge.

DISTRICT No. 13

[Provinces: Cebu, Oriental Negros, Misamis, Bukidnon, Lanao, Agusan, Leyte (western half) and Bohol]

Forest Station at Cebu, Cebu (district headquarters):
- Severo S. Ponce — Officer in charge.
- Aquilino Contreras — Ranger.
- Maximo Oro — Ranger.
- Marcelino Genove — Ranger.
- Miguel Pato — Ranger.
- Jose Flores — Ranger.
- Venancio N. Fernandez — Forest guard.
- Lucas Cabinas (Talisay) — Forest guard (Division of Investigation).

Forest Station at Dumaguete, Negros Oriental:
- Melecio Lopez — Officer in charge.

Forest Station at Butuan, Agusan:
- Angel Mallonga — Officer in charge.
- Rufo Burnea — Forest guard.

Forest Station at Kolambugan, Lanao:
- Bernardo Tocmo — Officer in charge.
- Lucio Abalos — Ranger.
- Faustino A. Guerrero — Ranger.
- Guillermo Langay — Forest guard.
- Venancio Tenerrife — Forest guard.

Forest Station at Dipolog, Zamboanga:
- Manuel Malana — Officer in charge.
- Gregorio Quezon — Forest guard.

Forest Station at Cabayan, Misamis:
- Timoteo Quimpo — Officer in charge.
- Leon Lopina — Forest guard.

DIVISION OF FOREST LANDS AND MAPS

Rafael Medina	Forester, chief.
Cecilio Maneja	Forest supervisor.
Doroteo Soriano	Forest surveyor.
Vicente Castillo	Senior Ranger.
Aniano David	Ranger.
Norberto Soloria	Ranger.
Eugenio de la Cruz	Ranger.
Tomas Raboy	Ranger.
Vicente Caguioa	Ranger.
Leoncio A. de la Cruz	Ranger.
Fernando L. Amarillas	Ranger.
Geronimo Tabamo	Ranger.
Victor Lara	Ranger.
Gervasio Rarang	Ranger.
Juan Oblina	Ranger.
Magdaleno Tugade	Ranger.
Joaquin Estrada	Ranger.
Juan Fontanoza	Ranger.
Celso Medrano	Ranger.
Antonio Quiaoit	Ranger.
Gregorio Zamuco	Ranger.
Leonardo F. Granada	Ranger.
Rafael San Pedro	Ranger.
Hermenegildo Alviar	Ranger.
Atanasio B. Catambay	Ranger.
Buenaventura Brillantes	Ranger.
Eulogio Dres	Ranger.
Aniceto Sulit	Ranger.
Ambrosio Bitonio	Ranger.
Primitivo de la Vega	Ranger.
Carlos Guerrero	Ranger.
Pio Salomon	Ranger.
Juan Pacheco	Ranger.
Pablo Umadhay	Ranger.
Rafael Quidilla	Ranger.
Ramon Acuña	Ranger.
Quintin Gellidon	Ranger.
Primo Icarañgal	Ranger.
Felix Jucaban	Ranger.
Daniel B. Allas	Ranger.
Daniel M. Espinosa	Forest guard.
Juan Acojido	Junior stenographer.
Lorenzo Sison	Clerk.
Edilberto Barot	Clerk.
Lorenzo Abrena	Clerk.
Claudio Mari	Clerk.

DRAFTING SECTION

Cornelio Samaniego	Draftsman, chief.
Gregorio Vicencio	Draftsman.
Hermogenes Reyes	Draftsman.
Agaton Villafuerte	Draftsman.

Marcelino Cruz	Draftsman.
Sebastian Domingo	Draftsman.
Cayetano Crisostomo	Draftsman.
Wenceslao Moje	Draftsman.
Alberto Gutierrez	Draftsman.
Luis Angeles	Draftsman.
Jose A. Domingo	Draftsman.

DIVISION OF SAWMILLS AND UTILIZATION

William Crosby	Forester, chief.
Royce F. Wendover	Forester.
Luis J. Reyes	Forester.
Felipe R. Amos	Forester.
Jose F. Nano	Forest supervisor.
Alberto Barros	Ranger.
Damian C. Domingo	Ranger.
Doroteo Antonio	Ranger.
Justo M. Pascual	Ranger.
Pablo Roque	Forest guard.
Sinforoso Apacible	Forest guard.
Doroteo Abella	Clerk.
Andres G. Ferrer	Clerk.
Aurelio Maglunog	Clerk.

ADMINISTRATIVE DIVISION

Vicente C. Ramos	Chief clerk.
Sulpicio Olimpo	Clerk stenographer.
Aurea Villaruz (Miss)	Junior stenographer.

ACCOUNTING SECTION

Eugenio Tadle	Chief.
Melchor Enriquez	Clerk.
Aguedo Castro	Clerk.
Deogracias Antonio	Clerk.
Arcadio Gepiga	Clerk.
Francisco Villa	Clerk.
Felipe Reyes	Clerk.
Crescencio Jimeno	Clerk.

PROPERTY SECTION

Cirilo Asperilla	Property clerk.
Pablo D. Villena	Clerk.
Venancio Babida	Clerk.
Santiago Laya	Clerk.
Victorino Narcelles	Clerk.
Agapito Arada	Clerk.
Demetrio Saluñga	Clerk.

RECORDS SECTION

Enrique Baña	Chief.
Aquilino C. Bartolome	Clerk.
Jose Salvador	Clerk.
Agustin Cardines	Clerk.
Juan G. Loteyro	Clerk.
Mariano Ocampo	Clerk.
Pedro Pineda	Clerk.

LIBRARY AND STATISTICAL SECTION

Simplicio Beltran	Chief.

GENERAL SERVICE SECTION

Quintin Ortega	Messenger.
Geronimo Roque	Messenger.
Apolonio Reynera	Messenger.
Bartolome Estacio	Porter.
Severino Esguerra	Watchman.
Epitacio Oblepias	Watchman.
Fernando Rañada	Janitor.
Pastor Ramos	Janitor.
Benito Zambales	Janitor.
Claudio Cabaylo	Janitor.
Agustin Lagan	Janitor.

DIVISION OF INVESTIGATION

Otto W. Pflueger	Forester, Chief.
Harold Cuzner [1]	Technical employee.
William H. Brown	Technical employee.
Luis R. Salvoza [1]	Forester.
Placido Dacanay	Forester.
Agapito L. Cenabre	Forest supervisor.
Juan Lopez	Forest supervisor.
Macario A. Mariano	Forest supervisor.
Alejandro de Mesa	Forest supervisor.
Carlos Sulit [2]	Forest supervisor.
Tomas N. Roque	Senior ranger.
Felipe Salvoza	Ranger.
Justino Seguerra	Ranger.
Mamerto D. Sulit	Ranger.
Andres Lemos	Ranger.
Constantino Rabaya	Ranger.
Nicolas Angeles	Nurseryman.
Florentino Canicosa	Nurseryman.
Maximo Pañga	Nurseryman.
Julian Revelleza	Nurseryman.
Antonio Banacijan	Nurseryman.
Estanislao Caracuel	Nurseryman.
Pio Alinzonorin	Forest guard.
Valentin Patame	Forest guard.
Alejandro Alcantara	Forest guard.
Sotero Manzanilla	Forest guard.
Braulio P. Flores	Forest guard.
Felix Columbres	Forest guard.
Gabino Canicosa	Forest guard.
Casimiro Aspiras	Forest guard.
Camilo Aspiras	Clerk.

[1] Without compensation from the Bureau of Forestry. [2] United States pensionado.

APPENDIX

APPENDIX

STATISTICAL TABLES

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value*

Province	Received from the Bureau of Lands												Certified to the Bureau of Lands for—					
	Pending from previous year						During the year 1923						Agriculture					
	A. C.	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total
Abra		2	1			3								1				1
Agusan		402	60	11		473		87	1		2	90		411	55	6	2	474
Albay		12	2			14		10			1	11		2	1			3
Antique		4				4					7	7						
Bataan		31	10			41			2		3	5		9	6			15
Batanes		1				1												
Batangas																		
Bohol																		
Bukidnon		136	1	4		141		40	3	7		50		136	2	7		145
Bulacan		1				1		1				1		2				2
Cagayan		702	52	1		755		136	11	3	1	151		573	61	2		636
Camarines Norte		30	3			33					3	3		1				1
Camarines Sur		27	2			29		2			45	47		16			6	22
Capiz		18	1			19								1	1			2
Cavite																		
Cebu		11	2	3		16		3	3	1		7		3	1	3		7
Cotabato		633	54	91		798		109	2		2	113		614	46	18		678
Davao		1,355	50	55		1,460		281	6		12	299		1,036	47	35	6	1,124
Ilocos Norte		2	1			3		1			46	47		1	1	1		3
Ilocos Sur		11				11					2	2		4			1	5
Iloilo		1	1			2			5		66	71			1		65	66
Isabela		1,359	57	13		1,429		72	48	11	1	132		1,186	89	23		1,298
Laguna		5				5			2	1	2	5		1	1			2
Lanao		596	36	9		641		222	32	3	137	394		543	47	11		601
La Union		4	1			5					84	84		4	1		79	84
Leyte		57				57			1		9	10		6			4	10
Marinduque								1				1						
Masbate		16	2			18		605	5		18	628						
Mindoro		930	47	11		988		150		3	1	154		910	36	11		957
Misamis		5	1			6					1	1		5	1			6
Mountain Province		8	1			9		3	1		10	14		3			1	4

NOTE.—A. C. = Agricultural Colony of 16 hectares lot; H. = Homestead; P. = Purchase; L. = Lease; F. P. = Free Patent.
A. C. for 1923 are included under Land Classification project.

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value*—Continued

Province	Received from the Bureau of Lands												Certified to the Bureau of Lands for—					
	Pending from previous year						During the year 1923						Agriculture					
	A. C.	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total
Nueva Ecija	.....	2,852	83	24	.....	2,959	.....	721	174	14	14	923	.....	3,117	220	26	10	3,373
Nueva Vizcaya	.....	560	52	13	.....	625	.....	104	.....	.....	1	105	.....	539	33	12	.....	584
Occidental Negros	.....	39	.....	2	.....	41	.....	.....	7	1	1	9	.....	13	5	.....	1	19
Oriental Negros	.....	5	.....	.....	.....	5	.....	.....	.....	.....	1	1	.....	2	.....	.....	.....	2
Palawan	.....	18	1	.....	.....	19	.....	.....	.....	.....	1	1	.....	3	1	.....	.....	4
Pampanga	.....	8	1	.....	.....	9	.....	2	.....	.....	.....	2	.....	8	.....	.....	.....	8
Pangasinan	.....	207	3	.....	.....	210	.....	73	3	.....	22	98	.....	203	6	.....	9	218
Rizal	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	25	27	.....	.....	2	.....	6	8
Romblon	.....	10	2	.....	.....	12	.....	2	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Samar	.....	21	.....	.....	.....	21	.....	.....	.....	.....	.....	.....	.....	4	.....	.....	.....	4
Sorsogon	.....	15	.....	.....	.....	15	.....	13	3	.....	.....	16	.....	15	2	.....	.....	17
Sulu	.....	10	1	2	.....	13	.....	32	2	3	.....	37	.....	10	1	1	.....	12
Surigao	.....	15	1	.....	.....	16	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	3
Tarlac	.....	30	2	.....	.....	32	.....	12	7	2	1	22	.....	39	7	2	1	49
Tayabas	.....	2,102	182	21	.....	2,305	.....	423	20	.....	10	453	.....	1,315	128	9	4	1,456
Zambales	.....	30	4	7	.....	41	.....	10	.....	.....	3	13	.....	28	1	3	.....	32
Zamboanga	.....	849	32	27	.....	908	.....	183	401	2	1	587	.....	512	404	13	.....	929
Total	.....	13,160	749	294	.....	14,193	.....	3,298	741	51	533	4,623	.....	11,279	1,197	183	193	12,854

Province	Certified to the Bureau of Lands for—						Returned to the Bureau of Lands uncertified during the year 1923					Total pending for inspection December 31, 1923					
	Forestry																
	A. C.	H.	P.	L.	F. P.	Total	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total
Abra	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Agusan	.....	11	1	2	.....	14	30	3	2	.....	35	.....	37	2	1	.....	40
Albay	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	19	1	.....	1	21
Antique	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	.....	.....	7	11
Bataan	.....	.....	.....	.....	.....	.....	11	5	.....	.....	16	.....	11	1	.....	3	15
Batanes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Batangas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bohol	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bukidnon	.....	3	.....	.....	.....	3	18	.....	.....	.....	18	.....	19	2	4	.....	25
Bulacan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cagayan	.....	221	9	1	.....	231	11	1	.....	.....	12	.....	33	2	1	1	37

Camarines Norte						8	1			9		21	2		3	26
Camarines Sur		2	1		3	6	1			7		6			38	44
Capiz												17				17
Cavite																
Cebu		1	1		2	1				1		9	3	1		13
Cotabato		7			7	18	3	62		83		123	7	11	2	143
Davao		92	5	17	114	28	1	2		31		480	3	2	6	491
Ilocos Norte						1				1		1			46	47
Ilocos Sur		4			4	1				1		2	1		1	4
Iloilo		1	1		2		1			1			3		1	4
Isabela		187	9		196	38	4	1		43		20	3		1	24
Laguna		3			3							1	1	1	2	5
Lanao		186	8		194	50	8			58		39	5	1	137	182
La Union															5	5
Leyte		28			28	3				3		20	1		5	26
Marinduque												1				1
Masbate						72	6			78		549	1		18	568
Mindoro		75	9	2	86							95	2	1	1	99
Misamis															1	1
Mountain Province		7			7							1	2		9	12
Nueva Ecija		297	21	8	326	157	14	3		174		2	2	1	4	9
Nueva Vizcaya		17	9		26	73	8	1		82		35	2		1	38
Occidental Negros		4		1	5	4				4		18	2	2		22
Oriental Negros		1			1	2				2					1	1
Palawan												15			1	16
Pampanga						1				1		1				1
Pangasinan		51			51	9			2	11		17			11	28
Rizal															19	19
Romblon												12	2			14
Samar		4			4							13				13
Sorsogon		7			7	3	1			4		3				3
Sulu						7				7		25	2	4		31
Surigao		2			2	1				1		9	1			10
Tarlac			2		2	2				2		1				1
Tayabas		844	44	10	898	208	16	1		225		158	16		6	170
Zambales		5	1		6	6	2	2		10		1		2	3	6
Zamboanga		61	3	1	65							459	26	15	1	601
Total		2,123	124	42	2,289	769	75	74	2	920		2,277	93	47	336	2,753

NOTE.—A. C. = Agricultural Colony of 16 hectares lot; H. = Homestead; P. = Purchase; L. = Lease; F. P. = Free Patent.
A. C. for 1923 are included under Land Classification project.

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value*—Continued

Fiscal year	Agricultural colonies			Homesteads			Sales			Lease		
	Agriculture	Forest	Total	Agriculture	Forest	Total	Agriculture	Forest	Total	Agriculture	Forest	Total
1905				80	6	86	8		8			
1906				318	16	334	20	1	21	1		1
1907				881	19	920	23		23	12		12
1908				2,456	51	2,507	49	1	50	26		26
1909				1,523	167	1,710	26	3	29	27		27
1910				1,175	385	1,560	36	3	39	42	2	44
1911				1,528	221	1,749	46	3	49	30	1	31
1912				2,609	301	2,910	95	11	106	47	1	48
1913				2,680	269	2,949	104	30	134	47	1	48
1913 (July 1 to December 31				1,653	159	1,812	81	16	97	41	3	44
1914				4,812	685	5,697	279	36	315	77	1	78
1915	1,086	28	1,114	5,965	688	6,653	317	52	369	70	1	71
1916	934	41	975	6,018	617	6,635	227	18	245	55	4	59
1917	670		670	7,632	797	8,429	457	27	484	118	6	124
1918	41		41	5,605	621	6,226	420	33	453	109	16	125
1919				5,256	790	6,046	431	51	482	137	22	159
1920				2,061	403	2,464	225	23	248	70	10	80
1921	56		56	203	25	228	33		33	13	2	15
1922				2,623	523	5,146	119	21	140	53	9	62
1923				11,279	2,123	13,402	1,197	124	1,321	183	42	225
Total	2,787	59	2,536	68,465	8,886	75,293	4,191	435	4,646	1,153	121	1,279

Fiscal year	Free patent			Returned uncertified to the Bureau of Lands					Grand total
	Agriculture	Forest	Total	H.	P.	L.	F. P.	Total	
1905									94
1906									356
1907									935
1908									2,583
1909									1,765
1910									1,643
1911									1,829
1912									3,064
1913									3,131
1913 (July 1 to December 31)									1,953
1914									5,890
1915									8,207

1916									7,964
1917				144	19	11		174	9,881
1918				215	11	16		242	7,087
1919				243	37	53		353	7,040
1920				309	49	22		380	5,172
1921				10	3	5		18	350
1922				152	24	6		182	3,530
1923	195		195	768	78	74		920	16,063
Total	195		195	1,881	219	167		2,269	86,538

SUMMARY

Applications pending from previous years	14,195	
Applications received during 1923	4,623	
		18,818
Certified for agriculture	12,854	
Certified for forestry	2,289	
Returned uncertified	920	
		16,063
Total pending December 31, 1923		2,753

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1923*

Species	Fiscal year—				July 1 to December 31, 1913
	1910	1911	1912	1913	
Red lauan					
White lauan	43,439	46,942	57,036	81,469	20,249
Apitong	20,764	21,096	28,929	32,391	12,905
Tañgile	2,106	2,762	3,999	5,249	3,390
Guijo	14,107	14,231	18,579	17,279	7,841
Yakal	8,225	8,150	14,491	21,770	5,593
Ipil	13,717	12,296	17,237	15,791	7,535
Molave	8,923	7,978	9,091	9,363	4,783
Narra	5,744	4,996	8,474	8,877	3,941
Kalantas	3,174	1,368	938	3,320	886
Palosapis					
Manggachapui					
Dungon	2,453	1,693	1,213	931	601
Tindalo	954	1,018	794	932	484
Akle	809	867	1,295	1,690	729
Lumbayao					
Pagatpat					
Other species:					
First group	574	322	707	1,000	687
Second group	6,667	6,644	7,988	8,543	3,266
Third group	8,316	10,927	11,796	8,711	2,999
Fourth group	36,786	41,655	42,981	59,855	25,613
Total	176,758	182,945	225,548	277,171	101,502

Species	Fiscal year—				
	1914	1915	1916	1917	1918
Red lauan					
White lauan	74,453	73,277	107,634	131,699	108,900
Apitong	32,328	38,849	52,529	55,335	56,274
Tañgile	14,682	15,460	28,961	25,389	21,775
Guijo	19,701	15,650	16,685	16,857	17,301
Yakal	15,115	14,714	16,471	11,963	9,162
Ipil	17,602	12,089	14,147	16,629	15,498
Molave	9,753	10,546	10,788	13,582	22,233
Narra	8,467	9,868	7,970	5,904	7,848
Kalantas	2,423	1,999	4,574	7,381	4,975
Palosapis	2,222	1,631	2,723	3,042	8,863
Manggachapui	1,469	1,859	2,666	2,916	2,214
Dungon	2,199	1,467	1,127	1,592	1,318
Tindalo	914	1,181	1,115	1,145	826
Akle	1,287	1,498	1,088	798	870
Lumbayao				6,085	4,415
Pagatpat				1,502	849
Other species:					
First group	2,196	2,190	3,074	1,084	1,416
Second group	9,373	6,940	7,938	6,432	7,779
Third group	7,557	6,920	5,214	9,895	8,611
Fourth group	73,017	60,130	56,738	47,661	80,933
Total	294,758	276,268	341,442	366,891	382,060

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1919 to 1923*—Continued

Species	Fiscal year—					Total 1910 to 1923
	1919	1920	1921	1922	1923	
Red lauan	.....	52,294	72,986	44,377	43,104	212,761
White lauan	180,556	119,833	125,536	185,853	213,020	1,569,896
Apitong	72,223	99,775	99,652	122,561	101,747	847,358
Tañgile	35,005	40,903	47,311	46,978	52,584	346,554
Guijo	25,924	28,413	30,652	26,155	26,921	296,296
Yakal	18,100	20,317	28,245	28,326	25,540	246,182
Ipil	18,926	24,720	28,556	34,621	26,159	275,523
Molave	26,088	30,173	31,826	30,840	30,195	256,162
Narra	11,152	12,711	16,164	9,032	12,414	133,562
Kalantas	5,040	8,622	5,350	3,764	8,267	62,081
Palosapis	15,661	7,594	5,928	6,098	6,397	60,159
Manggachapui	3,096	3,094	4,340	3,974	3,802	29,430
Dungon	1,839	2,607	2,726	1,829	2,873	26,468
Tindalo	1,080	1,387	3,404	1,914	1,743	17,891
Akle	937	2,047	1,553	1,441	3,101	20,010
Lumbayao	4,192	7,550	8,179	9,138	8,350	47,909
Pagatpat	2,766	4,743	5,454	2,240	1,854	19,408
Other species:						
First group	3,335	9,104	17,352	6,143	5,805	54,989
Second group	12,084	17,414	29,304	14,540	15,665	160,577
Third group	53,513	1,978	15,253	32,764	40,616	225,070
Fourth group	3,711	59,718	75,173	17,365	30,242	711,578
Total	495,228	554,997	653,944	629,953	660,399	5,619,864

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TABLE NO. 3.—*Revenue from public forests for the year 1923*

Province	Timber				Firewood		Minor forest products	Lease of forest land	Total charges and penalties
	First group	Second group	Third group	Fourth group	Bacauan tangal	Other wood			
Abra	₱2,125.75	₱1,917.23	₱487.00	₱82.80	₱56.75	₱362.82	₱291.62	.....	₱5,700.61
Agusan	838.78	216.83	215.22	124.82	26.00	1.69	1,734.63	.....	3,978.88
Albay	10,951.01	2,314.21	3,488.63	641.97	406.58	475.47	6,402.43	.....	27,918.31
Antique	222.52	51.23	52.03	55.20	1.50	14.86	115.99	.....	978.87
Bataan	401.08	1,169.59	2,634.45	2,989.24	553.81	1,054.78	1,933.58	.....	12,743.99
Batangas	1,168.32	231.48	73.09	111.47	1.50	495.00	2,990.16	₱25.00	6,039.21
Bohol	393.25	316.64	182.84	296.94	435.52	120.19	259.40	6.00	3,241.03
Bukidnon	34.07	.....	.....	.....	.....	.....	20.66	.....	71.75
Bulacan	1,154.73	547.61	704.06	735.23	40.81	158.33	1,170.83	.....	6,139.64
Cagayan	13,094.70	1,998.17	3,4.1.46	393.37	358.60	429.31	3,984.28	262.50	27,783.71
Camarines Norte	583.58	135.81	2,065.15	454.64	337.70	93.03	1,353.63	.....	5,959.69
Camarines Sur	1,380.48	1,394.09	1,151.71	900.80	327.74	351.48	7,047.25	200.00	14,160.93
Capiz	299.36	161.13	758.72	1,495.06	2,070.77	531.41	672.64	.....	7,086.76
Cavite	.....	2.58	.....	.....	2.42	139.40	86.39	.....	315.96
Cebu	1,530.59	169.84	278.57	208.68	487.99	628.20	744.53	173.85	6,874.91
Cotabato	11,687.70	2,560.98	1,583.51	822.84	1,095.08	950.41	1,961.83	.....	21,084.65
Davao	1,408.21	810.82	1,145.67	996.02	341.49	149.80	3,854.28	.....	11,048.06
Ilocos Norte	1,486.97	1,055.09	398.74	100.13	24.70	120.04	79.63	.....	4,218.17
Ilocos Sur	1,206.48	138.78	108.83	82.73	20.00	100.36	179.78	.....	2,874.50
Iloilo	7,187.71	2,351.68	2,175.24	1,564.10	650.06	1,661.44	4,321.14	170.50	23,455.48
Isabela	5,244.61	2,021.10	911.07	391.39	7.16	47.98	117.10	.....	11,811.58
Laguna	80.04	502.22	1,422.55	506.82	37.06	199.89	947.66	26.80	4,792.51
Lanao	198.15	367.54	247.28	480.20	25.51	21.00	186.91	.....	1,967.84
La Union	628.99	170.04	119.98	41.06	.....	3.40	58.18	92.00	1,644.50
Leyte	6,079.97	652.50	11,316.02	1,507.33	1,804.55	167.71	4,994.27	.75	31,780.02
Marinduque	153.40	72.11	39.95	127.32	14.70	44.05	419.27	.....	971.64
Masbate	15,825.17	938.87	920.21	1,044.21	1,285.96	615.05	3,821.16	230.00	25,615.21
Mindoro	2,686.41	816.90	487.83	761.05	2,672.21	594.94	2,990.26	496.05	13,414.72
Misamis	1,474.95	847.13	2,683.09	1,913.36	111.87	87.29	620.63	.....	10,174.95
Mountain Province	260.83	91.50	11,373.53	11.77	26.41	709.52	831.46	.....	13,716.91
Nueva Ecija	2,883.50	738.98	444.09	246.87	16.96	190.90	1,450.57	37.00	7,393.50
Nueva Vizcaya	920.05	99.20	72.36	6.89	1.23	1.50	8.23	53.25	1,423.72
Occidental Negros	5,398.91	1,797.35	1,862.00	3,071.49	1,042.78	1,930.42	4,576.70	45.00	22,671.96
Oriental Negros	542.78	625.84	173.64	137.75	22.80	333.77	2,303.89	45.00	4,958.58
Palawan	1,643.21	111.15	30.65	46.57	21.40	34.44	4,069.70	76.12	6,756.44
Pampanga	37.09	321.27	275.66	176.53	105.25	533.76	681.67	.....	2,880.40
Pangasinan	5,522.10	3,816.37	1,343.53	371.24	689.23	243.03	1,738.04	127.58	16,831.70
Rizal	107.39	133.79	58.45	143.97	6.41	802.61	557.58	.....	2,271.08
Romblon	290.13	179.04	257.01	21.40	.....	.....	405.82	.....	1,715.72
Samar	5,454.20	1,140.49	2,177.15	997.83	835.30	42.98	6,515.03	.....	23,634.86
Sorsogon	4,514.63	1,426.25	325.86	1,059.27	439.45	160.69	1,722.08	1.40	12,091.95
Sulu	25,303.12	805.17	704.50	79.39	1,639.90	.....	987.00	.....	30,848.09

Surigao	3,059.84	412.22	1,597.38	339.23	481.21	721.69	4,925.99	1.22	15,138.53
Tarlac	301.76	138.79	75.31	5.17	4.00	77.70	465.86	.....	1,517.53
Tayabas	39,888.61	2,368.23	1,722.44	975.51	3,432.33	1,634.19	11,197.76	5.00	65,255.44
Zambales	1,675.78	1,132.05	630.40	428.10	305.01	889.37	1,606.94	30.50	7,555.03
Zamboanga	16,460.69	5,417.73	27,180.84	7,642.88	1,931.31	612.07	3,259.74	6.00	64,625.72
Manila	107,915.60	26,422.56	171,756.59	96,873.65	1,640.12	477.66	16,107.95	134.00	429,723.74
Total charges	311,707.20	71,110.18	261,604.29	131,458.29	25,844.54	18,955.63	116,772.73	2,245.52	1,024,858.88
Total fines	31,288.41	7,506.88	11,670.30	10,132.51	4,347.10	4,422.08	15,769.65	23.57	.....
Grand total	342,995.61	78,617.06	273,274.59	141,590.80	30,191.64	23,377.71	132,542.38	2,269.09	1,024,858.88

NOTE.—In addition to the above revenue, ₱14,205.11 in the form of bond-deposits were confiscated for failure of the licensees without justifiable cause to manifest 60 per cent of the amount of forest products granted on their licenses, and ₱947.90 were collected as fees on gratuitous licenses, in all making a total of ₱15,153.01 from these sources.

TABLE NO. 4.—*Lumber licenses issued during fiscal year 1923 (January 1, to December 31)*

Province	For less than 100 cubic meters	For 100 cubic meters and less than 1,000 cubic meters	For 1,000 cubic meters and over	License agreements	Total commercial licenses	For personal use		For public works	Miner's gratuitous licenses	Total
						Inside communal forests	Outside communal forests			
Abra	69	16	.....	.....	85	30	29	3	.....	62
Agusan	3	6	1	.....	10	3	53	9	.....	65
Albay	4	26	7	.....	37	73	6	3	5	87
Antique	3	9	.....	.....	12	3	6	3	.....	12
Bataan	7	43	2	2	54	1	.....	4	.....	5
Batangas	.....	1	.....	.....	1	1	6	3	.....	10
Bohol	14	7	.....	.....	21	173	40	3	.....	216
Bukidnon	.....	2	.....	.....	2	.....	2	3	.....	5
Bulacan	23	22	.....	.....	45	17	2	3	5	27
Cagayan	50	50	2	.....	102	53	36	4	.....	93
Camarines Norte	5	13	2	.....	20	2	4	4	8	18
Camarines Sur	32	32	1	1	66	28	11	4	.....	43
Capiz	14	31	.....	.....	45	20	14	3	.....	37
Cavite	.....	.....	.....	.....	.....	.....	.....	3	.....	3
Cebu	23	10	1	.....	34	18	47	3	7	75
Cotabato	1	1	3	.....	5	.....	37	3	.....	40
Davao	26	28	3	.....	57	1	19	3	.....	23
Ilocos Norte	54	20	1	.....	75	80	3	3	.....	86
Ilocos Sur	55	.....	.....	.....	55	45	14	6	.....	65
Iloilo	11	10	.....	.....	21	13	25	3	.....	41
Isabela	66	32	.....	.....	98	57	4	3	.....	64
Laguna	14	9	1	.....	24	.....	.....	3	.....	3

TABLE No. 4.—*Lumber licenses issued during fiscal year 1923 (January 1, to December 31)*—Continued

Province	For less than 100 cubic meters	For 100 cubic meters and less than 1,000 cubic meters	For 1,000 cubic meters and over	License agreements	Total commercial licenses	For personal use		For public works	Miner's gratuitous licenses	Total
						Inside communal forests	Outside communal forests			
Lanao	6	4	3	1	14	.....	2	5	.....	7
La Union	31	4	.....	.....	35	26	2	6	.....	34
Leyte	40	31	4	.....	75	276	112	4	.....	392
Marinduque	3	8	.....	.....	11	3	1	3	.....	7
Masbate	5	42	4	2	53	61	6	3	5	75
Mindoro	9	66	2	.....	77	1	13	3	.....	17
Misamis	14	19	2	.....	35	109	45	6	.....	160
Mountain Province	28	23	3	1	55	.....	7	9	6	22
Nueva Ecija	16	21	2	.....	39	49	10	5	.....	64
Nueva Vizcaya	30	4	1	.....	35	13	4	3	.....	20
Occidental Negros	11	42	3	2	58	16	2	3	.....	21
Oriental Negros	2	10	1	.....	13	18	13	3	.....	34
Palawan	25	15	21	.....	61	1	22	3	.....	26
Pampanga	5	12	.....	.....	17	.....	.....	3	.....	3
Pangasinan	35	58	.....	.....	93	119	1	4	7	131
Rizal	10	.....	.....	.....	10	1	.....	3	.....	4
Romblon	.....	8	.....	.....	8	17	8	3	.....	28
Samar	74	32	1	.....	107	173	89	3	.....	265
Sorsogon	6	18	4	.....	28	11	8	3	.....	22
Sulu	.....	.....	3	.....	3	.....	.....	3	.....	3
Surigao	36	13	.....	.....	49	101	60	4	2	167
Tarlac	8	4	.....	.....	12	60	7	2	.....	69
Tayabas	49	84	4	1	138	57	3	6	7	73
Zambales	30	15	.....	1	46	53	1	3	.....	57
Zamboanga	16	22	6	4	48	93	73	5	2	173
Total	963	923	88	15	1,989	1,876	847	177	54	2,954
Total (1922)	1,210	676	131	15	2,032	1,974	684	162	51	2,871
Difference	—247	+247	—43	.....	—43	—98	+163	+15	+3	+83

NOTE: + = increase; — = decrease.

In the provinces of Cagayan, Isabela, and Pangasinan, eighty-nine (89) licenses were issued for building tobacco curing houses.

TABLE No. 5.—*Statement of forest products cut or gathered from registered private woodlands during fiscal year 1923*

Province	Timber					Firewood		Charcoal	Tanbark	Daluru
	First group	Second group	Third group	Fourth group	Total	First class	Second class			
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos.*	*Cu. m.*
Albay	.....	16	140	100	256	.....	.....	.....	.....	.....
Bataan	1	11	74	60	146	.....	78	15	.....	.....
Batangas	.....	.....	.....	.....	.....	.....	4,477	.....	.....	.....
Bulacan	.....	.....	.....	.....	.....	2,884	240	20	.....	.....
Camarines Sur	64	.....	.....	.....	64	.....	.....	.....	.....	.....
Capiz	.....	.....	.....	.....	.....	30	480	.....	.....	.....
Cavite	.....	.....	.....	.....	.....	.....	.....	7	.....	.....
Ilocos Norte	50	.....	.....	.....	50	.....	.....	.....	.....	.....
Iloilo	.....	.....	.....	.....	.....	20	384	42	.....	.....
Laguna	.....	.....	.....	.....	.....	.....	4,845	14,474	2,010	.....
Mindoro	.....	.....	.....	.....	.....	111	3	.....	.....	.....
Nueva Ecija	.....	.....	.....	.....	.....	.....	560	.....	.....	.....
Occidental Negros	57	10	185	78	330	.....	3,957	.....	.....	.....
Palawan	.....	.....	.....	.....	.....	7	2,787	.....	.....	.....
Pampanga	.....	.....	.....	.....	.....	14,619	10,504	2,971	.....	26
Rizal	66	25	18	233	342	.....	5,640	3	.....	.....
Tarlac	5	31	.....	116	152	.....	2,058	60	.....	.....
Tayabas	57	.....	.....	.....	57	.....	10	27	.....	.....
Total	300	93	417	587	1,397	17,671	36,023	17,619	2,010	26

TABLE NO. 5.—*Statement of forest products cut or gathered from registered private woodlands during fiscal year 1923*—Ctd.

Province	Split rattan	Buri	White earth	Gogo	Lime-stone	Nipa	Dyebark	Kamagsa	Boho	Unhusked lumbang seeds.
	Kilos	*Kilos*	*Balls*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Pieces*	*Kilos*
Albay										
Bataan									19,000	
Batangas					25,000					
Bulacan						1,257,720				
Camarines Sur										
Capiz						1,147,316				
Cavite										
Ilocos Norte										
Iloilo										
Laguna			1,850							21,685
Mindoro						4,000				
Nueva Ecija	133,200			2,200						
Occidental Negros										
Palawan						1,880	11,067			
Pampanga						193,080				
Rizal								200		
Tarlac		19,422								
Tayabas										
Total	133,200	19,422	1,850	2,200	25,000	2,593,996	11,067	200	19,000	21,685

TABLE NO. 6.—*Minor products licenses in force during fiscal year 1923 (January 1, to December 31)*

Province	Firewood	Charcoal	Dyewood	Tanbarks and dyebark	Wood oils	Almaciga resins and others	Gutta-percha	Bejuco and diliman	Gogo	Sand gravel and stone	Others	Total
Abra	20							11			4	35
Agusan	37			1				29		1	4	72
Albay	3							14			6	23
Antique	30	3						6			4	43
Bataan	28	11				3		40	6		5	93
Batangas	3			1				1	4		3	12
Bohol	20	1							1		5	27
Bukidnon	1											1
Bulacan	1	6				3		10	3		3	26
Cagayan	15	1		3		3		36			8	66
Camarines Norte	15			2		2		9		1	4	33

Camarines Sur	30			5		7		73			2	117
Capiz	30	3						6			4	43
Cavite	1								1		2	4
Cebu	76	2					1			6	38	123
Cotabato	7		1			1	2	3			11	25
Davao	18	2	2	1	4	1		15			13	56
Ilocos Norte	7							2			2	11
Ilocos Sur	4									5	4	13
Iloilo	41	6	8	7				12			5	79
Isabela	11							27				38
Laguna	5	3						24	11	1	23	67
Lanao	3			1				3			6	13
La Union	14			9				3			1	27
Leyte	36	2				5		52			5	100
Marinduque	7	2		1		1		12	1		6	30
Masbate	29			10				29	2		5	75
Mindoro	45	1		27		3		55	12		23	166
Misamis	11							17			6	34
Mountain Province	15	3				1		29		2	3	53
Nueva Ecija	4					11		20	6		7	48
Nueva Vizcaya	1			1				9				11
Occidental Negros	53					13		79	16		8	169
Oriental Negros	15					4		30	6		2	57
Palawan	7			23		14		11	8		11	74
Pampanga	9	3		1				6	1		2	22
Pangasinan	14	3		13				4				34
Rizal	20	6		2				14	7		7	56
Romblon	2					11		4			1	18
Samar	31	1		2				59			8	101
Sorsogon	21			3	1	7		17		2	2	53
Sulu	1											1
Surigao	8	1		3		2		16				30
Tarlac	1					1		10	6		1	19
Tayabas	85	18		16		24		71	8	26	42	290
Zambales	25	2		3		6		23	10		26	95
Zamboanga	32	5		6		1	3	37			14	98
Total	892	85	11	141	5	124	6	928	109	44	336	2,681
Total (1922)	864	98	10	153	24	91	9	886	147	29	263	2,574
Difference	+28	—13	+1	+12	—19	+33	—3	+42	—38	+15	+73	+107

NOTE: + = increase; — = decrease.

TABLE No. 6-A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1923 (January 1 to December 31)*

Province	Timber					Firewood class		Charcoal	Dyewood	Tanbark
	Group				Total	First	Second			
	First	Second	Third	Fourth						
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos*	*Kilos*
Abra	894	1,333	492	220	2,939	.....	4,286	.....	.....	.....
Agusan	327	253	44	218	842	114	59	2	.....	.....
Albay	6,178	2,094	3,181	1,168	12,621	2,029	4,334	6	.....	3,937
Antique	102	31	22	57	212	3	125	.....	.....	5,660
Bataan	208	7,248	33,018	17,886	58,360	1,903	9,217	3,370	.....	.....
Batangas	84	27	36	161	308	3	4,801	.....	.....	53,860
Bohol	185	230	172	627	1,214	4,051	1,698	56	.....	678
Bukidnon	26	.....	.....	.....	26	.....	.....	.....	.....	.....
Bulacan	557	519	941	1,456	3,473	50	670	1,069	.....	552
Cagayan	6,808	925	3,661	797	12,191	1,475	2,149	.....	.....	5,379
Camarines Norte	271	336	2,860	1,315	4,782	1,943	195	.....	.....	29,725
Camarines Sur	2,862	2,667	9,792	4,840	20,161	983	3,466	4	.....	21,193
Capiz	181	101	659	2,550	3,491	3,093	5,201	152	.....	3,896
Cavite	.....	.....	.....	.....	.....	.....	1,655	25	.....	800
Cebu	207	118	191	251	767	311	5,505	39	.....	11,835
Cotabato	4,326	1,588	1,505	1,591	9,010	5,628	4,632	.....	.....	65,723
Davao	424	477	1,041	1,113	3,055	1,035	48	82	.....	15,600
Ilocos Norte	590	616	396	161	1,763	545	685	.....	.....	.....
Ilocos Sur	338	99	59	179	675	50	444	.....	.....	3,720
Iloilo	158	105	71	246	580	1,751	14,361	237	771,815	135,637
Isabela	2,119	1,500	802	684	5,105	.....	483	.....	.....	.....
Laguna	81	388	1,220	645	2,334	.....	2,268	46	.....	1,408
Lanao	319	668	33,583	21,174	55,744	.....	174	.....	.....	.....
La Union	249	97	78	77	501	.....	52	.....	.....	10,396
Leyte	2,519	574	8,976	2,357	14,426	5,506	1,342	22	.....	6,968
Marinduque	60	75	45	330	510	7,775	2,740	401	.....	.....
Masbate	7,724	1,168	1,123	2,172	12,187	7,745	1,105	8	.....	22,759
Mindoro	2,956	2,263	495	3,543	9,251	13,141	4,017	53	.....	263,482
Misamis	356	274	1,436	2,683	4,749	530	830	.....	.....	400
Mountain Province	870	203	10,468	49	11,590	.....	5,446	9	.....	.....
Nueva Ecija	1,122	627	317	631	2,697	.....	954	4	.....	15,529
Nueva Vizcaya	395	95	86	34	610	.....	.....	.....	.....	.....
Occidental Negros	4,503	2,145	61,523	128,595	196,766	5,201	21,703	.....	.....	2,325
Oriental Negros	242	541	257	220	1,260	138	1,948	.....	.....	.....
Palawan	25,429	2,240	681	112	28,462	21	.....	.....	1,550	198,787
Pampanga	15	225	267	300	807	661	5,578	64	.....	10,568
Pangasinan	1,596	2,165	1,393	533	6,087	3,413	1,465	163	.....	318,161
Rizal	51	78	271	515	915	.....	13,931	106	.....	2,060

Romblon	112	159	238	46	555					
Samar	2,446	1,064	4,243	1,663	9,416	7,198	499	2		50,736
Sorsogon	4,161	994	833	2,333	8,321	2,381	1,018	22	431	26,712
Sulu	4,475	250	617	118	5,460	9,829	2	70		13,250
Surigao	743	158	442	841	2,184	2,615	6,995	45		43,856
Tarlac	119	110	63	19	311		1,483			16,520
Tayabas	18,862	3,505	33,188	15,279	70,834	14,622	18,301	2,358		213,046
Zambales	637	1,043	1,219	1,058	3,957	2,072	8,135	3	2	5,000
Zamboanga	5,943	7,885	32,647	22,415	68,890	6,054	3,399	133		182,180
Total	113,224	49,261	254,652	243,262	660,399	119,869	167,399	8,551	773,798	1,762,338
Total (1922)	116,081	46,498	264,156	203,218	629,953	118,881	178,506	7,702	448,887	2,297,713
Difference	—2,857	+2,763	—9,504	+40,044	+30,446	+988	—11,107	+849	+324,911	—535,375

Province	Oleo-resin	Manila copal	Daluru	Guttapercha	Split rattan	Unsplit rattan		Diliman	Limestone	Gogo
						Over 2 cms. in diameter	2 cms. in diameter or less			
	Kilos	*Kilos*	*Cu. m.*	*Kilos*	*Kilos*	*Lin. m.*	*Lin. m.*	*Kilos*	*Kilos*	*Kilos*
Abra					225	9,650	182,450		32,034	
Agusan					82,310	3,250	42,410	2,100		
Albay					274,392	5,800	15,080			
Antique					4,908			201		
Bataan					16,053	23,185	51,400	1,280		3,399
Batangas			6		1,911			4	2,500	79,235
Bohol	40	20		276				2,434		257
Bukidnon					1,712					
Bulacan		229			7,842	92,557	84,829	64		325
Cagayan		10,030			124,990	6,359	38,125			
Camarines Norte					139,834		8,284	968	41,033	
Camarines Sur		275,966			293,653		277,400	1,579		
Capiz					3,590	4,000		422		
Cavite					89					1,046
Cebu	164				8,543					
Cotabato				8,164	432		11,100			
Davao		228,528			15,290	270	63,000	398		
Ilocos Norte					476				29,800	
Ilocos Sur					600				53,176	
Iloilo	153				8,206		1,000	2,426	5,000	97
Isabela					613	28,678	114,510			
Laguna					11,842	5,000	13,500	5,342		628
Lanao					3,479	1,555	122	7,120		
La Union					7,200					
Leyte	6,376				117,220	154,038	235,028	38,331		14
Marinduque					7,219	480		11,789		

NOTE: + = increase; — = decrease.

TABLE NO. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1923 (January 1 to December 31)*—Continued

Province	Oleo-resin	Manila copal	Daluru	Guttapercha	Split rattan	Unsplit rattan		Diliman	Limestone	Gogo
						Over 2 cms. in diameter	2 cms. in diameter or less			
	Kilos	*Kilos*	*Cu. m.*	*Kilos*	*Kilos*	*Lin. m.*	*Lin. m.*	*Kilos*	*Kilos*	*Kilos*
Masbate					173,071		29,400	332		686
Mindoro					64,606	6,000	76,050	18,279		5,859
Misamis					23,268	4,963	18,380	2,225		
Mountain Province					67,036	28,994	82,564		259,928	
Nueva Ecija					19,546	43,200	474,750	18		15,010
Nueva Vizcaya					50	100	6,168			
Occidental Negros	3,184				23,272	6,285	39,038	3,579		5,701
Oriental Negros	12,416				67,186		350	3,172		8,890
Palawan	6,150	58,938			8,497		617,517			8,335
Pampanga			102		2,045		1,376	370		1,256
Pangasinan			32		878	5,000	73,472	609		243
Rizal					14,384					1,999
Romblon	6,408	5,520			175		9,600	1,012		
Samar					340,969	49,980	39,960	17,869		
Sorsogon	23,296	100			63,757		2,000	60		
Sulu	304				1,428					
Surigao	2,880				185,046		1,930			
Tarlac		800			8,892		255,880			3,464
Tayabas	1,714	33,114			387,921	951,030	1,852,280	3,652		463
Zambales		646	29		6,511	177,740	1,896,845	100		13,018
Zamboanga		505	1	5,333	36,333	675	25,000	2,329		
Total	63,085	614,396	170	13,773	2,627,500	1,608,789	6,640,798	128,064	423,471	149,925
Total (1922)	108,464	560,011	192	13,398	2,480,270	1,316,544	6,076,247	157,499	224,480	224,480
Difference	—45,379	+54,385	—22	+375	+147,230	+292,245	+564,551	—29,435	+198,991	—74,555

Province	Stone, sand, and gravel	Buri	Guano	White earth	Nipa	Dyebark	Cabonegro	Hingiw	Fern tree	Anahaw	Manila elemi
	Cu. m.	*Kilos*	*Kilos*	*Balls*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Whole*	*Kilos*	*Kilos*
Abra											
Agusan					63,037						
Albay			8,000		80,380						
Antique											
Bataan		200			3,410			100			
Batangas		6,242			2,564		3,410	560			
Bohol	20	6,585	4,595,838		336,780						

Bukidnon											
Bulacan					1,245,800			184			
Cagayan		2,250			241,386						
Camarines Norte					26,740						
Camarines Sur		2,370			73,216			160			
Capiz		66,073			334,490	2,083					
Cavite							50				
Cebu	462	61,198			34,902			6,921			
Cotabato		771			46,325						
Davao	51				76,228	4,800					
Ilocos Norte						2,272					
Ilocos Sur											
Iloilo		9,666	432,762		9,920						
Isabela											
Laguna		126		1,900			31,748	2,614	15		
Lanao					22,344						
La Union					500						
Leyte					103,521	62		200			
Marinduque		14,378	428,439					665			
Masbate		11,836			1,600			6,870			600
Mindoro		12,090			321,160	9,673		1,000			
Misamis					7,020						
Mountain Province	908								8		
Nueva Ecija		27,624						189	400	4,000	
Nueva Vizcaya											
Occidental Negros					327,820						
Oriental Negros		120			23,350						
Palawan						80,723					
Pampanga	1	48,562			69,800						
Pangasinan		2,140			7,180	1,220					
Rizal						1,148		1,950			
Romblon		15,647									
Samar					56,794	30		5,808			30
Sorsogon					3,470			364			
Sulu					2,063						
Surigao											
Tarlac		1,910									
Tayabas	9,933	153,593			6,315	4,676	4,773	13,575		581	41,397
Zambales					19,236	320					
Zamboanga					116,425			580			
Total	11,375	443,381	5,465,039	1,900	3,663,776	107,007	39,981	41,740	423	4,581	42,027
Total (1922)	3,893	1,233,807	797,856	3,500	3,728,619	94,747	46,058	33,385	468	4,024	37,146
Difference	+7,482	—790,426	+4,667,183	—1,600	—64,843	+12,260	—6,077	+8,355	—45	+557	+4,881

NOTE: + = increase; — = decrease.

TABLE NO. 6–A.—*Report of utilization of forest products from public forest of the Philippine Islands during the fiscal year 1923 (January 1 to December 31)*—Continued

Province	Salago bark	Beeswax	Christmas tree	Mortar (stone)	Kamagsa	Beeswax refined	Other vines for tying	Boho	Lumbang oil	Lumbang seeds	
										Unhusked	Kernels
	Kilos	*Kilos*	*Lin. m.*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Pieces*	*Liters*	*Kilos*	*Kilos*
Abra		102						800			
Agusan											
Albay	1,559										
Antique											
Bataan								31,546			
Batangas										32,311	8,930
Bohol											
Bukidnon											
Bulacan								1,410			
Cagayan		30						350			
Camarines Norte											
Camarines Sur											
Capiz											
Cavite										3,406	
Cebu											
Cotabato		2,795								24,276	3,879
Davao		322							1,802	22,851	4,749
Ilocos Norte										14,767	
Ilocos Sur				30,290							
Iloilo								55			
Isabela											
Laguna					23,398						
Lanao		125									
La Union											
Leyte											
Marinduque											
Masbate											
Mindoro		130				250					
Misamis											
Mountain Province		7	1,013								
Nueva Ecija											
Nueva Vizcaya											
Occidental Negros											
Oriental Negros											
Palawan		1,608				13,259					
Pampanga											
Pangasinan									4,170	4,170	
Rizal					3,520						
Romblon											
Samar											
Sorsogon											

Sulu		20								43,386	
Surigao											
Tarlac											
Tayabas					6,512					20,457	
Zambales											
Zamboanga		1,105					123			49	
Total	1,559	6,244	1,013	30,290	33,430	13,509	123	34,161	5,972	165,673	17,558
Total (1922)	3,185	12,570	1,009	48,160	21,572	185					
Difference	—1,626	—6,326	+4	—17,870	+11,858	+13,324	+123	+34,161	+5,972	+165,673	+17,558

NOTE: + = increase; — = decrease.

NOTE.—In addition to the above figures on timber there were 82 table tops manifested in the provinces of Agusan, Bataan, Cagayan, Camarines Sur, Cotabato, Ilocos Norte, Isabela, Leyte, Mindoro, Misamis, Mountain Province, Nueva Vizcaya, Samar, and Tayabas. The corresponding volume in cubic meters of this product cannot be ascertained as the collection of forest charges thereon is based upon the diameters of particular pieces.

TABLE NO. 6-B.—*Status of illegal caiñgins reported during the fiscal year from January 1 to December 31, 1923*

Province	Number of cases	Area cleared in hectares	Forest products destroyed						Total forest charges
			First group	Second group	Third group	Fourth group	Firewood	Total volume cu. m.	
Abra	8	11.50	1.53	7.25	3.03	10.08	175.00	196.89	₱80.94
Agusan	7	1.33	2.79	4.18	48.87	61.29		117.13	185.54
Albay	129	99.04	288.11	1,026.78	1,147.91	2,746.40		5,209.20	9,563.12
Antique									
Bataan	31	29.53	1.32	42.27	108.19	287.98		439.76	709.50
Batanes									
Batangas									
Bohol	7	1.05	26.69	34.24	.63	72.11		133.67	311.10
Bukidnon	37	51.35	15.00	85.80	1,001.00	2,268.00		3,369.80	4,593.00
Bulacan	20	9.35	2.66	9.98	18.67	274.05		305.36	332.68
Cagayan	11	17.30	54.02	72.45	137.48	227.78		491.73	610.28
Camarines Norte	101	112.75	271.59	141.69	1,056.93	711.15		2,181.36	4,480.80
Camarines Sur	30	61.73	28.94	24.53	254.49	945.11		1,253.07	1,208.59
Capiz									
Cavite									
Cebu	127	62.76	243.40	975.61	1,606.97	2,421.87		5,247.85	10,429.76
Cotabato	10	55.50	5.00		762.00	1,720.00		2,487.00	3,242.00
Davao	2	1.20		3.78	32.38	12.61		48.77	95.91
Ilocos Norte	40	80.80	146.00	169.00	329.00	514.00	1,074.00	2,232.00	2,613.80
Ilocos Sur	8	29.30				40.41	160.00	200.41	41.42
Iloilo	13	23.93	2.40	14.96	32.83	461.63	220.00	731.82	576.85
Isabela									

TABLE No. 6–B.—*Status of illegal caiñgins reported during the fiscal year from January 1 to December 31, 1923*—Continued

Province	Number of cases	Area cleared in hectares	Forest products destroyed						Total forest charges
			First group	Second group	Third group	Fourth group	Firewood	Total volume cu. m.	
Laguna	1	2.00	.....	1.98	16.72	35.18	.....	53.88	74.46
Lanao	1	.50	.....	.....	70.08	20.57	.....	90.65	160.74
La Union	2	1.00	.....	.....	.....	.....	.....	.....	.....
Leyte	112	72.32	160.47	315.73	1,558.87	2,439.75	.....	4,474.82	7,360.40
Marinduque	.....	.....	.....	.....	.....	.....	.....	.....	.....
Masbate	325	206.20	896.36	784.94	3,565.37	3,542.00	.....	8,788.67	17,509.36
Mindoro	8	11.00	55.68	39.42	132.24	312.69	.....	540.03	999.82
Misamis	31	29.65	36.76	58.28	1,125.61	1,506.39	.....	2,727.04	4,218.74
Mountain Province	3	4.25	.....	.....	.....	.....	.....	.....	.....
Nueva Ecija	12	34.25	97.42	11.91	50.71	162.59	.....	322.63	785.35
Nueva Vizcaya	17	24.25	.....	34.31	47.56	131.32	.....	213.19	329.41
Occidental Negros	135	128.05	425.82	954.79	2,468.30	5,375.72	15.00	9,239.63	11,266.33
Oriental Negros	37	17.87	14.93	83.90	175.32	1,495.97	.....	1,770.12	2,200.80
Palawan	52	46.00	197.50	156.30	207.60	424.00	.....	985.40	2,273.37
Pampanga	7	3.50	.....	47.07	83.84	170.22	.....	301.13	430.58
Pangasinan	23	21.80	3.11	95.89	52.64	413.12	.....	564.76	821.62
Rizal	.....	.....	.....	.....	.....	.....	.....	.....	.....
Romblon	6	11.33	119.32	177.06	1,288.87	853.24	.....	2,438.49	4,558.90
Samar	92	55.79	92.21	73.37	6,367.20	1,015.35	.....	7,548.13	12,405.02
Sorsogon	151	59.44	12.49	1,691.94	3,804.84	3,979.87	.....	9,489.14	10,527.17
Sulu	.....	.....	.....	.....	.....	.....	.....	.....	.....
Surigao	21	17.24	61.97	206.06	293.92	567.03	.....	1,128.98	2,282.94
Tarlac	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tayabas	81	86.71	351.27	410.28	2,414.66	1,781.34	.....	4,957.55	9,467.25
Zambales	2	1.50	.....	6.67	19.09	27.20	.....	52.96	85.74
Zamboanga	59	63.26	107.87	135.92	872.75	1,436.21	.....	2,552.75	4,066.01
Total	1,759	1,546.33	3,722.63	7,898.34	31,156.57	38,464.23	1,644.00	82,885.77	130,899.30
Total (1922)	3,110	2,803.55	6,474.07	9,666.29	45,056.10	77,050.07	19,736.00	157,982.53	232,228.47
Difference	—1,351	—1,257.22	—2,751.44	—1,767.95	—13,899.53	—38,585.84	—18,092.00	—75,096.76	—101,329.17

NOTE: — means decrease.

Province	Number of cases reported to provincial fiscal	Number of cases reported to justice of the peace	Number of invoices sent to provincial or municipal treasurer	Pending report	Results of action taken					
					Convicted	Dropped or acquitted	Pending	Collected		Warned
								Number	Amount	
Abra		1	2		1		1	1	₱7.00	5
Agusan		3	2			1	2	2	67.36	2
Albay	31	53	18	27	54	3	42	3	85.56	
Antique										
Bataan		3	2	13			3	2	49.36	13
Batanes										
Batangas										
Bohol		4	3		4			3	65.53	
Bukidnon		37					37			
Bulacan			20				2	18	289.76	
Cagayan		2	9		1	1	7	2	227.48	
Camarines Norte		27	23	51		1	49			
Camarines Sur		17	4	9	8		12	1	15.06	
Capiz										
Cavite										
Cebu	1	124	1	1	98	1	27			
Cotabato										10
Davao		2					2			
Ilocos Norte			15				4	11	133.80	25
Ilocos Sur			8				3	5	85.00	
Iloilo		10	3		3		10			
Isabela										
Laguna		1					1			
Lanao		1			1					
La Union										2
Leyte	2	87	23		62	3	43	4	187.37	
Marinduque										
Masbate		119		206	26	1	91	1	11.63	
Mindoro		7	1		7		1			
Misamis	4	16	11		1		27	3	191.82	
Mountain Province										3
Nueva Ecija	2	3	2	1	1	3	3			4
Nueva Vizcaya		4					4			13
Occidental Negros	2	108	4	21	19	2	93			
Oriental Negros		24	6	7	17	4	5	4	322.12	
Palawan		5		18			5			29
Pampanga		3					3			4
Pangasinan			18	5			18			
Rizal										

TABLE No. 6–B.—*Status of illegal caiñgins reported during the fiscal year from January 1 to December 31, 1923*—Continued

Province	Number of cases reported to provincial fiscal	Number of cases reported to justice of the peace	Number of invoices sent to provincial or mnnicipal treasurer	Pending report	Results of action taken					
					Convicted	Dropped or acquitted	Pending	Collected		Warned
								Number	Amount	
Romblon	6				1	1	4			
Samar	2	88		2	56	8	24	2	31.32	
Sorsogon	4	132	10	5	19	2	125			
Sulu										
Surigao		18	3		17	1		3	68.40	
Tarlac										
Tayabas	12	48	21		20	1	39	21	1,282.12	
Zambales		2					2			
Zamboanga		14	5		8	6	3	2	60.06	40
Total	66	963	214	366	424	39	692	88	3,180.75	150
Total (1922)	126	1,140	320	59	430	35	1,018	90	(x)	1,537
Difference	—60	—177	—106	+307	—6	+4	—326	—2	3,180.75	—1,387

NOTE: — means decrease; + means increase; (x) means no figure taken.

REMARK.—Of the 7 cases under Agusan, 2 are nipa caiñgins the amount of destruction reported being 12,000 shingles.

TABLE NO. 7.—*Statement showing the quantity and value of minor forest products exported during the fiscal year 1923 (January 1 to December 31)*

	Kilos	Value
Copal (almaciga):		
United States	306,140	₱73,227
United Kingdom	207,652	61,323
Belgium	18,200	4,712
France	24	25
Germany	2,110	650
China	1,000	235
British East Indies	230,605	34,713
Japan	188,393	50,697
Australasia	7,165	1,372
Total	961,289	226,954
Elemi (pili resin):		
United States	36,620	11,080
Germany	6,263	2,260
Total	42,883	13,340
Guttapercha:		
British East Indies	12,123	9,384
Total	12,123	9,384
Rubber:		
United States	2,400	2,270
British East Indies	36,649	43,803
Total	39,049	46,073
Lumbang (candle nut) oil:		
United States	78,053	22,760
United Kingdom	43	30
Total	78,096	22,790
Sapan wood (sibukao):		
China	1,016,638	25,133
Total	1,016,638	25,133
Grand total		343,674

TABLE NO. 8.—*Statement of appropriation and expenditures, Bureau of Forestry (January 1 to December 31, 1923)*

Appropriation:		
Act No. 3060		₱518,812.00
Equipment carried forward from 1922		330.77
Resolutions Nos. 11, 14, 22, 36, 43, 49, 52, 66, 79, 85, 99, and 111		2,820.63
		521,963.40
Expenditures:		
Salaries and wages	₱378,688.70	
Traveling expenses of personnel	72,500.99	
Freight, express, and delivery service	3,150.00	
Postal, telegraph, and cable service	8,510.00	
Illumination and power service	4,100.00	
Miscellaneous service	1,000.00	
Rental of buildings and grounds	9,500.00	
Consumption of supplies and materials	31,319.90	
Printing and binding report	3,000.00	
Traveling expenses not government employees	450.00	
Maintenance and repair	1,172.00	
Furniture and office equipment	1,739.95	
Extraordinary losses	80.27	
Total expenditures		515,211.81
Balance, January 1, 1924		6,751.59
Statement of the Bureau of Forestry appropriation, expenditures, and revenues for the fiscal year 1923:		
Appropriation		521,963.40
Revenue and other collections		1,062,437.38
Expenditures		515,211.81
Surplus		547,225.57
Percentage of expenditures to revenue		48%

TABLE NO. 9.—*Revenue derived from the sale of forest products and expenditures of the Bureau of Forestry since its organization, April 14, 1900*

Fiscal year	Revenue	Expenses	Surplus	Expenses
				Per cent
1901 to 1906[a]	₱2,268,591	₱1,118,887	₱1,149,704	49
1907	191,080	105,050	86,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913[a]	390,664	227,048	163,616	59
1913 (July 1 to December 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
1917	536,328	281,126	255,202	53
1918	650,692	334,254	316,438	51
1919	805,229	473,242	331,986	58
1920	1,009,879	541,488	468,390	54
1921	1,013,151	524,921	488,230	51
1922	949,279	486,846	462,432	51
1923	1,062,437	515,211	547,225	48
Total	11,825,149	6,301,846	5,523,299	54

[a] Up to 1913, the fiscal year was from July 1 to June 30.

TABLE NO. 10.—*Lumber production with relation to population*

Fiscal year	Population	Production in board feet	
		Total	Per capita
1903	7,635,426	36,615,000	4.8
1918	10,314,310	105,286,000	10.2
1919	10,551,539	136,486,000	12.9
1920	10,794,223	152,957,000	14.3
1921	11,042,490	180,277,000	16.3
1922	11,296,467	173,615,000	15.7
1923	11,556,286	182,006,000	15.8

APPROXIMATE EQUIVALENT

Timber is manifested in round or squared form, measured in cubic meters. The average board feet production is 275 board feet per cubic meter.

TABLE NO. 11.—*Relations between revenues, expenditures and surplus derived from sale of forest products*

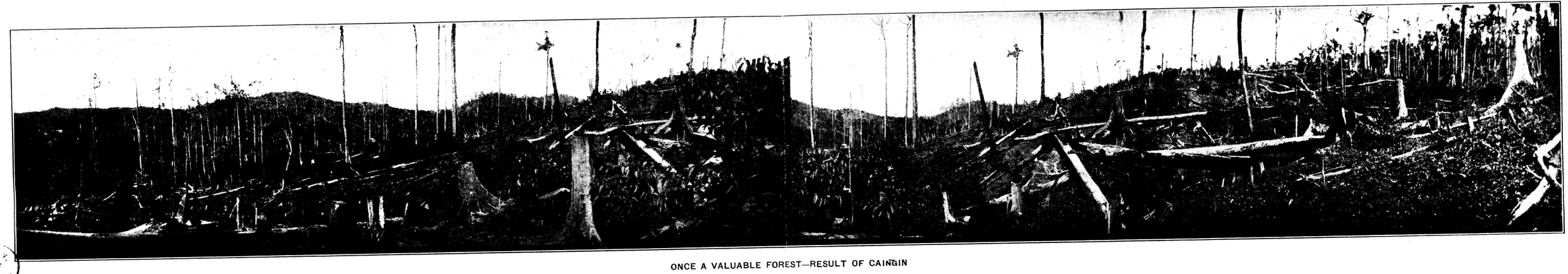
Fiscal year	Revenues		Expenditures		Surplus	
	Total	Per capita	Total	Per capita	Total	Per capita
1903	₱527,415	₱0.068	₱211,647	₱0.028	₱315,768	₱0.041
1918	650,692	0.063	384,254	0.037	316,438	0.031
1919	805,229	0.076	473,242	0.045	381,989	0.036
1920	1,009,879	0.093	541,488	0.050	468,391	0.043
1921	1,013,151	0.092	516,422	0.047	496,729	0.045
1922	949,280	0.083	486,847	0.043	462,433	0.041
1923	1,062,437	0.092	515,211	0.044	547,225	0.047

TABLE NO. 12.—*Comparative statements of lumber and timber exported and imported to and from the Philippines*

Year	Exported			
	Board feet	Value in pesos [1]	Differences in board feet	Per cent of increase and decrease
1903	None	None		
1918	7,080,376	650,796	— 267,120	— 3.7
1919	6,813,256	805,427	+ 7,049,000	+103.4
1920	13,862,256	1,834,297	— 2,012,088	— 15.5
1921	11,790,168	1,574,664	+ 6,494,832	+ 57.6
1922	18,285,000	1,667,940	+18,664,904	+102.7
1923	36,949,904	3,057,907		

Year	Imported			
	Board feet	Value in pesos	Difference in board feet	Per cent of increase and decrease
1903	7,632,000		—1,238,504	—16.2
1918	6,393,496	468,119	— 393,048	— 6.2
1919	6,000,448	592,059	+1,838,464	+30.6
1920	7,838,912	761,930	+2,981,768	+38
1921	10,820,680	937,543	—8,989,000	—83
1922	1,831,680	116,863	+ 239,136	+13.05
1923	2,070,816			

[1] Customs declaration value.



ONCE A VALUABLE FOREST—RESULT OF CAINGIN

Philippine Islands. Bureau of forestry.

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

Annual Report of the Director of Forestry of the Philippine Islands

For the Fiscal Year Ended December 31, 1924

ARTHUR F. FISCHER
Director of Forestry

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ANNUAL REPORT OF THE DIRECTOR OF FORESTRY

MANILA, *January 24, 1925*

SIR: I have the honor to submit the Annual Report of the Bureau of Forestry for the fiscal year ending December 31, 1924. The undersigned takes this occasion to acknowledge the hearty support, loyalty and efforts of the entire personnel of the Bureau during the year. I am forced to state, however, that towards the end of the year there was an undercurrent of strain and discontent that, while it did not manifest itself openly in the work of the Bureau, could nevertheless be felt. This was due to the failure to provide in the appropriations for increases in salary in accordance with the schedule approved by the Governor-General and the Director of Civil Service in 1920, many of the personnel not having received any promotion or increase in pay during the past four years. The same cause has also made itself felt in a lowering of the standard of the students entering the Forest School and it has become very difficult to get a sufficient number of men with the mental and educational qualifications requisite for the development of first-class rangers.

PERSONNEL

The inadequacy of the personnel and funds allowed the Bureau of Forestry in its appropriation is yearly becoming more acute. The demand for certificates of Government inspection and grading on shipments of lumber to the United States and foreign countries has increased to such an extent that the personnel of the Bureau trained in such work has been able to keep up with it only by neglecting other work. This can be readily seen from the data of lumber exported for the last three years, i. e., in 1922, 18,300,000 board feet; in 1923, 36,950,000 board feet; and in 1924, 50,760,000 board feet. The classification of public lands also, has become very pressing without a sufficient increase in personnel to hasten the consummation of this work. Furthermore, now that a corps of technically trained foresters

has become available by the return from the United States of the Bureau's pensionados, it is desired to follow up these parties, for the purpose of making accurate and detailed surveys and studies of the forest zones established by them, with the aim of putting these zones under permanent scientific administration. In addition to the above, there has been a very heavy increase in the number of applicants for special permits, which has thrown a heavy load on the clerical force, as well as on the technical field force, because, while the latter are responsible for the examination and location of the areas applied for, the former have to record and handle the fees accruing therefrom.

After reductions of personnel due to resignations and other causes, the classified force of the Bureau of Forestry on December 31, 1924, consisted of: 1 Director, 13 foresters (1 without compensation), 1 assistant forester, 1 forest surveyor, 11 forest supervisors (2 in the United States as pensionados), 176 rangers, 54 clerks, 12 draftsmen, and 3 messengers, making a total of 272.

The temporary employees were: 1 technical employee (without compensation), 3 rangers, 1 clerk, 1 draftsman, 94 forest guards, 6 nurserymen, 1 porter, 2 watchmen, 5 janitors, 2 carpenters, 2 varnishers, and 1 laborer, making a total of 119.

The entire force on December 31, 1924, was, therefore, 391.

DIVISION OF FOREST MANAGEMENT

With the rapid increase of the activities of this division as formerly organized, and the necessity for a closer and more intensive administration of the public forests, a reorganization plan was put into effect on April 1st, whereby the section of licenses was removed from the old Division of Forest Management and was made a separate division, the former chief of the old division being transferred as chief to the new one.

Under the reorganization, the Division of Forest Management was assigned the work of handling the preparation of legislation and regulations, reconnaissance and special projects, statistics, supervision and coördination of personnel and extension service, while the Division of Licenses was assigned the work of issuing all licenses, special permits, caingins, and fire-patrol.

Owing to the lack of personnel, the undersigned was obliged to assume temporarily the duties of chief of the reorganized Division of Forest Management in addition to his other work and the assistant chief was forced to devote practically all of his time to teaching (20 to 24 hours of classroom work per week)

in the School of Forestry at Los Baños. As a consequence, some of the activities of this division had to be delegated to the chiefs of other divisions and it has not yet functioned as it should. At the end of the year arrangements were made to contract the services of an experienced forester and as the assistant chief will be relieved of the necessity of teaching in the School of Forestry by the return from the United States, of one of the Bureau's pensionados, it is hoped to get the division organized and functioning satisfactorily early in 1925.

The personnel of the division at the end of the year consisted of seven foresters, one forest supervisor, and one stenographer.

LEGISLATION

It is the duty of the chief of this division to prepare all legislation and regulations affecting directly or indirectly the interests, administrative policy, and control of the Bureau of Forestry. Recommendations and suggestions governing proposed legislation and regulations therefore must first be submitted to him by the different division chiefs, district foresters, or other entities interested, for revision and final draft, before it is forwarded to the Director of Forestry for his approval. This, it is hoped, will relieve the division chiefs of the slow and tedious work of framing legislation and eliminate duplication of work in preparing forest regulations.

During the year a final draft of the Revised Forest Regulations was prepared and submitted to the Department Secretary on December 16, 1924, for his approval. Once approved by the Secretary, it will be published in booklet form, similar to the Forest Regulations promulgated on September 11, 1917, for distribution. Also, there have been presented to the Legislature, by different entities, a number of bills, which were duly commented by this office, as follows:

1. *H. B. No. 362.*—An Act amending section eighteen hundred and thirty-four of the Revised Administrative Code, requiring timber licensees to deposit bonds for their fulfillment of the conditions of their licenses.

2. Reforestation bill (C. R. No. 1693), setting aside ₱50,000 for reforestation and afforestation purposes.

3. An Act to amend several sections of Act numbered 2711, known as the Revised Administrative Code and for other purposes.

4. *H. B. No. 1643.*—An Act making compulsory the official scaling of logs by the Bureau of Forestry in all business transactions.

5. *H. B. No. 1394.*—An Act granting the inhabitants of La Union, the free use of timber from the public forests of said province during a period of four years.

6. *H. B. No. 1706.*—An Act granting the inhabitants of the Province of Cagayan the free use of timber and other forest products for domestic purposes, from the forests of said province, until December 31, 1925, and for other purposes.

7. *No. 1422.*—Regarding communal pastures.

8. *S. B. No. 431.*—Converted into Act 3208, regarding appropriation of waters.

9. *S. B. No. 416.*—An Act creating a board of agricultural colonies and defining its duties and powers, and making an appropriation for agricultural colonization.

Of these S. B. No. 431, was actually passed and is now Act No. 3208 and H. B. No. 1422 was approved by both houses of the legislature and is now pending the approval and signature of the President of the United States.

PERSONNEL AND EXTENSION SERVICE

As the work with which this division is charged, i. e., the correlation of the activities of the different divisions, the coördination of the personnel and the preparation of working plans for future application and practice in the administration of our forests and forest lands, is of a nature requiring high technical skill, it is believed that the personnel of this division should consist only of men possessing technical training in forestry and the assistants to these men should be forest supervisors, or at least senior rangers.

The first duty of this division will therefore be to correlate the activities of the different entities, the coördination of the personnel thereof and to perfect the administrative machinery, by eliminating as far as possible the friction caused by overlapping of authority and the duplication of work by different entities.

RECONNAISSANCE AND SPECIAL PROJECTS

Its next step, logically will be the formation and development of a staff, to take over the work of reclassifying the forest zones, established by the land classification parties of the Division of Forest Lands and Maps, for the purpose of ultimately excluding all land of an agricultural nature, the establishment of forest reserves with permanent boundaries and the preparation of working plans, the enforcement of which will give the maximum permanent sustained yield without detriment to the forest.

All reconnaissance and special projects will be treated as preparatory studies leading to the development of working plans for the areas upon which the work is performed, and data will

be gathered and compiled which will be of use in the preparation of such working plans.

The formation of a staff for this work will necessarily be slow as the present activities of the Bureau are actually more than the present personnel can properly attend to. It is hoped, however, that by eliminating the tedious and expensive inspection of individual parcels of public land, applied for under homestead, lease or purchase through the establishment of forest zones, and by the employment of more forest guards, relieving the present technical field staff of the onerous work of patrol against fire and theft of forest products, sufficient personnel will become available in the near future to make a beginning along the lines outlined.

FOREST STATISTICS

The work under this section practically was abandoned during the first five months of the year, as it became necessary to transfer the clerical force assigned to it, to the section of licenses in order to clean up the huge number of pending applications for special permits and leases. About the middle of June, however, it became possible for the clerical force to reassume their duties and in addition two graduate rangers were temporarily assigned to help out in the preparation of the work of the section. This, of course, was prejudicial to the field work of the Bureau, but was unavoidable, as there were no funds available for the employment of additional clerks.

Efforts have been made to compile, as much as possible, the data desired and described in the previous annual report, but it developed that all the information necessary for such compilation is not available.

The preparation of the necessary forms and the gathering of the data by the district officials, will be brought up at the annual foresters conference to be held on February, 1925, and it is hoped that, through the coöperation of the said officials, the necessary data will be received in such a form and sufficiently early to warrant its compilation and inclusion in the next annual report of this division.

FOREST DISTRICT OF NORTHERN LUZON

[Headquarters: Vigan, Ilocos Sur. It includes Administrative Districts Nos. 1 and 2]

District No. 1: Headquarters, Aparri, Cagayan.—Provinces: Cagayan, Isabela, and Northern portion of Ilocos Norte. Area: 10,155.6 square miles.

There has been a slight improvement in the lumber industry, in that, whilst the licensees cutting logs produced practically the same amount as in 1923, the two sawmills increased their output. The mill at Zinundungan cut 1,996.86 cubic meters and the mill at Clavería owned by the Northern Luzon Lumber Co., cut 1,280.70 cubic meters.

The number of ordinary timber licenses decreased from 248 in 1923 to 237 in 1924. This apparent decrease is largely due to the transferring of a part of the territory administered by the Clavería Forest Station to the Vigan Forest Station in District No. 2.

A thriving furniture industry has been recently built up in Aparri, and a number of shops are now turning out beds, tables, aparadores, and chairs, that compare very favorably with furniture made in Manila. The material employed by the local shops is only of the very best, being narra, tindalo, ipil, etc., and the prices charged are lower than Manila prices for furniture of the same grade.

A big reduction is noted in the number of gratuitous licenses issued in 1924, i. e., 179 compared with 274 in 1923. This decrease is attributed to the fact that there was a good tobacco crop, at good prices and prospective home builders were better able to buy their materials from licensees or sawmills and also, a fee of ₱2 being charged for each license, kept many from applying.

The number of minor forest product licenses increased this year to 197 from 121 last year. This gain is very largely due to the fact that dealers in *caña boho*, nipa shingles, and nipa sap, were required to take out licenses this year for the first time.

There was a big reduction in caiñgin permits, only 31 having been granted this year, and only 11 cases of caiñgin making was detected.

The forest officers of this district reported for collection from licensees the sum of ₱6,197.84, for violations of their cutting regulations, and ₱3,709.91 from nonlicensees, or a total of ₱9,907.75, a most excellent showing. The activity of the forest officers in checking up violations of the Forest Law, as indicated by these collections, is very probably responsible for the reduction in activity of the *caiñgineros*.

District No. 2: Headquarters, Vigan, Ilocos Sur.—Provinces: Ilocos Norte (except Bangui and Langangan), Ilocos Sur, and Abra. Area: 3,588.8 square miles.

The lumber industry this year has shown practically no improvement over 1923, 168 ordinary timber licenses having been issued in 1924 as against 167 for the year previous. Also, the number of ordinary minor forest-product licenses were exactly the same in 1924 as in 1923, i. e. 59.

No fires of any importance have occurred this year to damage the forests, but there was an increase in caiñgin permits from 9 in 1923 to 99 this year. Most of the caiñgin permits granted were of for members of the non-Christian tribes, Christian Filipinos being invariably required to apply for special residence permits. In addition, 136 cases of illegal caiñgin making were detected. Seventy of these being made by non-Christians and as it was the first time they were caught, they were left off with a reprimand and warning. Of the balance 38 were attributed to a member of the Provincial Board in Abra, who caused them to be made by advising the people that, by declaring public land and paying the taxes thereon, they could evade punishment. The poor *caiñgineros* were dealt with according to law, but the instigator of the caiñgins reaped a golden harvest, since he was a notary public and there were plenty of documents involved in the fraudulent declarations for which he charged them heavily.

Two hundred and seventy land applications were received during the year as compared with 68 during 1923. Although one ranger was transferred from Aparri to Vigan to help in this work, there remained 90 applications pending examination at the end of the year.

Total collections of ₱2,647.39 for infractions of the forest law were reported for 1924.

FOREST DISTRICT OF NORTH CENTRAL LUZON

[Headquarters: Baguio, Mountain Province. It includes Administrative District No. 3]

District No. 3: Headquarters, Baguio, Mountain Province.—Subprovinces: Benguet, Bontoc, and Lepanto, and Provinces of La Union (northern part) and Ilocos Sur (southern part).

The only change in the extent of the territory of this district was made on June 25, when the municipality of Angaki was transferred to it from District No. 2, of Northern Luzon. With regard to the personnel, there has been a reduction of one forester and one ranger, transferred to other districts. As this reduction was made after the dry season was over, the work of the district has not materially suffered.

There has been a heavy demand in the Province of La Union for house posts of molave and guijo, the licenses in Tubao and

Pugo getting from ₱25 to ₱30 for posts 25 to 30 centimeters in diameter.

In the Mountain Province most of the licenses issued were for small amounts and according to the Bureau's records only two of these have been operating. The two largest licensees however, have been very active. Mr. H. C. Heald, with a 20-year concession, having cut and manifested 4,504.99 cubic meters, and the Benguet Consolidated Mining Co., 6,963.64 cubic meters. The sawmill of Mr. Wm. A. Ebert which was sold to Mr. Joe Rice in 1923, continued operations on a small scale up to May, when it shut down due to lack of timber. Its cut was only 82.65 cubic meters. The total cut of these three concerns, therefore, is 11,551.28 cubic meters, as against 9,550.15 cubic meters for the previous year. The sawmill of the Igorot Exchange at Sagada, Bontoc, operated regularly during the year, its cut being reported as 313.56 cubic meters.

The Bureau's policy, which has been followed for the past four years, of marking all trees to be cut and leaving from 10 to 15 vigorously growing young trees to reseed the area, has given excellent results, especially in the mature stands of pine, where reproduction had been either very poor or entirely lacking, due to ground fires and grazing. It entails a heavy investment in commercial timber, however, and this coming year a reduction to not over 10 trees is to be tried out, where conditions are suitable.

Areas in the concessions of the Benguet Consolidated Mining Co., on Mount Apalan and of H. C. Heald on Mount Santo Tomas, cut over two, three, five, and ten years ago when inspected were found to be reproducing very satisfactorily.

The Mountain and Ilocos provinces are undoubtedly grazing districts. The general public is getting better informed of the necessity of permits for occupying public-forest lands as obviously indicated by the increase in the number of permittees. In 1923 only 23 permits were issued and in 1924, 115 covering a total area of 2,716 hectares.

One serious fire occurred during the year on Camisong and Ponopon hills, within the Benguet Consolidated Mining Company's concession. About 130 hectares of forest and 20 hectares of grass land were burnt over, about 4,000 saplings 30 to 50 centimeters high being killed and 136.34 cubic meters of mining posts and timbers destroyed. The fire started in a pasture area, and was most probably of incendiary origin.

In addition there were 35 small grass fires during the year, which caused little damage.

It is planned this coming year to burn under supervision the areas most exposed to fire before the start of the dry season. Also, if the appropriation allows, fire lanes will be established in the vicinity of Baguio.

The policy of reducing the cutting of firewood and timber in the vicinity of Baguio is being closely adhered to and no trees are now allowed to be cut except only dead or dying trees and in a few places small trees where thinning is necessary or advisable. This policy is followed on unreserved public lands as well as in the reserves and now, even many lot owners are getting permission from the office of the district forester before felling trees on their private land.

The mining operations in the district have continued to increase and are bound to increase considerably in the next few years. A considerable amount of timber is used every year in these mines, and the Bureau of Forestry is confronted with the problem of seeing that bona fide miners are provided with the necessary supply of timber for legitimate mining work. The time has now come for the Bureau of Forestry to make its own inspection of the mineral claims in this and other districts to determine the required development work for which affidavits are now accepted as prima facie evidence of compliance to the law, as well as to determine the equitable distribution and legitimate utilization of the timber which is included in many claims staked during the "rush for gold," thus depriving bona fide miners suitable areas to get the timber needed. The development of the mines should be encouraged in every way as it will be economically beneficial to the region, mainly in providing employment to several thousands of the natives of the Mountain and Ilocos provinces.

FOREST DISTRICT OF CENTRAL LUZON

[Headquarters: Manila. It includes Administrative Districts Nos. 4, 9, 11.]

District No. 4; Headquarters, Dagupan, Pangasinan.—Provinces: Nueva Ecija, Nueva Vizcaya, Pangasinan, Tarlac, and La Union (southern part). Area: 8,718 square miles.

In general there has been a slight increase in the lumber industry, first and second group timber being furnished by the local licensees, whilst the third and fourth group species were mainly supplied in the form of manufactured lumber by the

big sawmills from other districts. The demand for firewood rattan and other minor forest products has been very good.

The number of ordinary timber licenses issued during the year was 168, which is eleven less than that of the previous year. This was due to the disapproval of a large number of applications, owing to no forested areas being available or else that the operations of the applicants during previous years had not been satisfactory. One hundred and ten of these license areas have been inspected at least once and in some cases twice. Most of those not inspected were for small amounts of timber or the operations did not warrant it. As a result of these inspections 79 cases of violations were reported for collection, involving the sum of ₱1,718.07. There were also 76 cases reported against nonlicensees totaling ₱916.68.

In addition to the above, there were 303 gratuitous timber licenses issued, which is 229 less than the previous year. This decrease is almost entirely due to the requirement of a ₱2 fee for each license issued and indicates that previous to this requirement, there were a large number of applicants who had little or no intention of constructing a residence as required by law.

The number of pasture permits in force during the year were 147 as against 59 last year and 15 in 1922. In addition to those issued there are several applications pending final action in the Manila office and 59 applications pending inspection in the local forest stations.

Due to the failure of the food crops in certain parts of the district it was found necessary to issue 114 caiñgin permits. This was 58 more than in 1923. The area which was mostly brush or second growth forest, covered by the permits is 133 hectares. There were also issued 59 residence permits or leases, the applicants having first applied for caiñgin permits.

The making of caiñgin by the non-Christian tribes, still continues the most difficult problem to resolve, the requirement by law that they be only warned for a first offense making it almost impossible to punish them, especially as due to their nomadic habits, a man who has already been warned in one district, may be again caught in another district without the forest officer, who catches him the second time, being aware of the first offense. The only apparent solution is the establishment of caiñgin zones in which they will be required to make their caiñgins.

There has been a notable increase in the number of applications for special uses permits, 248 being granted this year as

against 67 last year. Fifty-nine of these as mentioned above were granted in lieu of caiñgin permits. At this rate of increase, it will soon be impossible for the personnel to handle the line of work, and unless more men are assigned to the district, the other branches of work will be sure to suffer.

District No. 9: Headquarters, Puerto Princesa, Palawan.—Province: Palawan. Area: 5,617 square miles.

During the past year, there was general improvement, both in prices and demand, especially for kalantas. The production of timber from Southern Palawan remained stationery or showed a very slight increase over the previous year, but in Northern Palawan there was a reduction of between 10 per cent and 15 per cent due to the growing scarcity of the trees of the first group and the increasing length of the haul to the beach. The personnel remained the same, i. e., four rangers.

The number of ordinary timber licenses in force at the end of the year were 76 as compared with 60 minor product licenses.

There are three small sawmills operating in the district, the same number as the previous year. One of these mills contracted its output with the creosoting plant of the Atlantic Gulf Co. in the shape of apitong ties and timbers.

One hundred and fifty-six cases of illegal caiñgin making were reported during the year, 120 of which, the *caiñgineros* being non-Christians, were only warned. Of the remainder, one case was convicted and 35 are still pending trial. The destruction of the forest by the non-Christians is becoming a serious problem, due to the law requiring that they be warned for the first offense, as these people can rarely be caught a second time, since they are smart enough, should a forest official detect a caiñgin made by a man who has already received his warning, to claim that it is being made by his father or some other relative or friend. The only solution of this problem is the employment of guards during the caiñgin season, greater activity of the rangers during that time, and the enforcement of the provincial policy to confine the making of caiñgins to the coastal flats and brush land or noncommercial timber whenever this is available.

District No. 11: Headquarters, Manila.—Provinces: Bataan, Bulacan, Cavite, Pampanga, Rizal, and Zambales. Area: 5,106.1 square miles.

Conditions of the lumber market showed some improvement over the previous year, both in the prices paid and the demand for lumber. During the rainy season, however, there was a

severe slump in the demand for timber, but the majority of the licensees met this by storing their timber until, towards the end of the year, the market recovered and there was a brisk demand.

There was a total of 176 ordinary timber licenses and 2 concessions in force this year as compared with 167 ordinary timber licenses and 2 concessions last year, an increase of only 9 licenses. This is principally due to the fact that all the forested areas worth while are occupied. Of this number, 78 cutting areas were inspected and reported on. This is a very good showing when the lack of personnel and assignment of it to special projects is considered.

The demand for minor forest products was excellent, the licensees in bejuco and firewood showing the most activity.

There is a noticeable decrease in the number of gratuitous licenses due entirely to the imposition of a fee of ₱2 for each license.

During the year there were issued a total of 349 caingin permits in connection with the inspection of residence and other special permits which is a reduction of 193 from the previous year. These permits were issued as soon as the parcel of land applied for had been examined, and the rental fee of ₱0.50 per hectare paid. This enabled the applicant to enter and clear the land at once pending the issuance of the regular permits by the Manila Office. Thirty illegal caingins by Christians and 5 by non-Christians were discovered during the year as compared with 84 the previous year. The Christian population of the district is now well informed regarding the caingin laws and in general obey these laws, but the non-Christians are not obeying them and it is futile to try to control them, as long as they can only be warned for a first offense.

Sixty-eight pasture permits were issued during the year and 17 applications were pending inspection at the end of the year.

With the exception of one grass fire, which occurred on June 11th in Palauag and Santa Cruz, Zambales, there were no destructive fires reported.

At the end of the year the personnel of this district consisted of 9 rangers, 10 forest guards, and 1 clerk.

FOREST DISTRICT OF SOUTH CENTRAL LUZON

[Headquarters: Los Baños, Laguna. It includes Administrative Districts Nos. 5 and 12]

District No. 5: Headquarters, Los Baños, Laguna.—Provinces: Batangas, Laguna, Marinduque, and Tayabas. Area: 6,184.9 square miles.

Timber licensees operating along the Manila Railroad line were very active during the first semester of the year filling

lumber and timber orders for Japan. The sawmill operators in the district also had a successful year. They all had increased their outputs, some as high as 50 per cent. Those licensees who were not so successful during the year were operating mainly on areas distant from good transportation line. In the towns of Mauban, Lucban, and Tayabas, Tayabas Province, the establishment of several Chinese lumber yards, which could sell their product at comparatively low price, reduced considerably the activities of the licensees in said towns.

There was an increase of 317,639 kilometers or 105.6 per cent of trail notes taken during the year over that of 1923.

The number of timber licenses in force in the whole subdistrict during the year was 201 as against 183 in 1923. Ordinary minor forest-products license in force in 1924 were 339 as compared with 333 in the previous year. The number of gratuitous licenses in force during the year was 110. Many lumber users find it more advantageous financially to buy their materials from lumber dealers rather than to apply for a gratuitous license.

There have been reported 57 cases of violations committed by licensees involving an amount of ₱2,976, ₱413.36 of which has already been collected.

Cases of illegal caiñgins reported this year were 19 less than those in 1923. The number reported this year was 54 involving an amount of ₱7,494.16, and 27 of which cases are still pending.

There were submitted during the year 162 applications for residence permits, 60 of which were disapproved and 92 still pending.

A new portable sawmill was recently installed by licensee L. F. Dee in barrio Sumulong, Calauag. A caterpillar tractor was used by this licensee in his logging operations but this method did not work well during the rainy season.

District No. 12: Headquarters, Calapan, Mindoro.—Province: Mindoro. Area: 3,981.6 square miles.

The condition in general of the lumber industry in this subdistrict was unsatisfactory. Only those who owned boats for the transportation of their products to the markets were able to maintain fairly active operations. Most of the shipments were made to the Manila Electric and Light Company, the Sugar Centrals in Negros, and the Mindoro Sugar Company.

The minor forest-product licensees were, in general, equally inactive on account of poor market conditions.

The crude selection method of logging is not destructive to young growth. Fair reproduction exists of first group species, except kalantas, which is excellent. The reproduction of lower group species is generally very good.

With the exception of some minor grass fires, there was no forest fire of any significance reported this year.

There were 81 timber licenses in force in the subdistrict during the year. It is gratifying to note that there were no reports of violations committed by licensees except those in which the operator failed to use his license within a period of four months. There were 21 gratuitous licenses granted during the year.

The officer in charge of the subdistrict reports that there has been considerable abuse by the people of the free use privilege. Trees have been cut in the communal forests under the guise of personal use, while in reality they were for commercial purposes. To require some kind of a permit from the officers in charge of stations for trees cut in communal forests is recommended.

A land classification party has been sent about the end of the year by the Manila Office to classify lands in this subdistrict. It is believed the work of this party will help greatly in the solution of the public-land problem and in the administration of the public forests.

No botanical collection has been submitted by the personnel of this subdistrict. It is hoped, however, that more attention will be paid to this kind of work next year.

FOREST DISTRICT OF SOUTHERN LUZON

[Headquarters: Legaspi, Albay. It includes Administrative District No. 6]

District No. 6: Headquarters, Naga, Camarines Sur.—Provinces: Camarines Norte, Camarines Sur, Albay, Sorsogon, and Catanduanes. Area: 6,665.5 square miles.

General business conditions throughout the subdistrict since the beginning of the year were favorable for increased activities of licensees. Many timber licensees have asked for additional amounts. The demand for ties was particularly active in the Provinces of Albay and Sorsogon. The minor forest-products licensees also had a very active year. The orders for rattan particularly came in much faster than the licensees were able to

fill. There was an unusual demand for this product in bailing abaca, which commanded a very good price during the year.

There was an increase of thirteen (13) ordinary timber licenses and one license agreement over last year. One hundred and seventy-three (173) ordinary timber licenses and 2 license agreements were in force this year as against 160 and 1, respectively, in force in 1923. The increase, undoubtedly, was due to better lumber market conditions.

The number of gratuitous licenses in force during the year was only 129 as compared with 274 the year previous. This decrease is due largely to the fact that the people are now finding to their financial advantage to buy timber and lumber direct from lumber dealers or licensees.

There were 117 cases of violations involving an amount of ₱2,636.19 committed by nonlicensees reported this year as against 173 cases covering an amount of ₱2,917.27 in 1923.

It is gratifying to note that there has been reported during the year very few cases of abuse of the free use privilege. The efforts exerted at every opportunity by forest officers in this subdistrict in explaining to the people the forest laws and regulations apparently are now showing results.

The number of special permits issued this year was more than double that of 1923. The unusual increase was due to the abandonment of the policy, except in emergency cases, of granting caiñgin permits.

More cases of illegal caiñgins have been reported this year: 375 cases in 1924 involving an amount of ₱31,446.29 as against only 253 cases in 1923 covering an amount of ₱17,265.72 for charges and recharges for the timbers destroyed. It is a practice common among abaca planters in this subdistrict to first clear up an area intended for caiñgin of its underbrush and a few of the lower story trees, and then plant abaca. When the crop is reaching maturity the bigger trees are cut down. Thus, detection of caiñgins during the first stage of clearing is rendered difficult.

A new concession in Caramoan Peninsula was granted to Cadwallader-Gibson Lumber Company. This concession contains one of the best stands of timber in the district. A small sawmill has already been established and it is now busy turning out lumber for the construction of the necessary buildings for a proposed bigger sawmill.

FOREST DISTRICT OF ORIENTAL VISAYAS

[Headquarters: Tacloban, Leyte. It includes Administrative District No. 10]

District No. 10: Headquarters, Tacloban, Leyte.—Provinces: Samar, Leyte (eastern part), Surigao, and Mabaste. Area: 11,124.2 square miles.

The personnel at the end of the year consisted of one forester, one forest supervisor, ten rangers and six forest guards, a total of eighteen.

Due to the increased activity of licensees and the extra work entailed in scaling and checking sawmills' records, the personnel was not sufficient to properly control the illegal cutting of timber and making of caingins.

Owing to the good demand and good prices for lumber there has been material progress in the logging and sawmill operations during the past year. Two small sawmills were newly installed towards the end of the year and are now operating.

Although no modern logging machinery has been introduced new and improved logged trails have been constructed and the number of men and carabaos employed has increased materially. The chief centers of activity were on the eastern coast of Leyte, southern coast of Samar, northern Leyte, and in Dinagat Island. Little increase in activity was noted on northern and eastern Samar, owing to difficulty of transportation. In Masbate there was considerable activity in making ties for the Sugar Centrals of Negros and Panay and the Philippine Railway at Iloilo.

In the eastern part of the district, there were several small fires started by caingin makers, but no appreciable damage was done to the forest growth, as there is no distinct dry season and the undergrowth in the dense forest never dries out. In Masbate, there were numerous grass fires, but no damage was reported to the forests there. The real danger to the forests is not from fires but from caingin makers.

The number of ordinary timber licenses issued this year is 251 as against 278 last year. The reason for this reduction can be traced to the requirement of a deposit guaranteeing that 60 per cent of the amount applied for, will be cut, thus eliminating applicants who only want a license in order to sell same or collect fees for letting other people use it. Four hundred and eighty-four private gratuitous licenses were issued this year as against 745 in 1923, 11 public gratuitous timber licenses and 4 miners gratuitous timber licenses were also issued. Auxiliary invoices aggregating ₱5,439.11 were submitted covering

violations by licensees during 1924. Auxiliary invoices aggregating ₱4,044.24 were also submitted covering violations by nonlicensees.

Two hundred and seventy-six minor forest-products licenses and 68 special permits or leases were issued.

During the year, 680 caiñgins were reported by forest officers. Of this number 169 were convicted, 16 acquitted, 8 were fined administratively and the balance are pending action.

FOREST DISTRICT OF OCCIDENTAL VISAYAS

[Headquarters: Cadiz, Negros Occidental. It includes Administrative Districts Nos. 7 and 13]

District No. 7: Headquarters, Cadiz, Negros Occidental.—Provinces: Antique, Capiz, Iloilo, and Negros Occidental & Romblon. Area 8,332.9 square miles.

As compared with last year, conditions in the lumber market have shown a change for the better, the big demand from the sugar centrals for ties and general construction purposes being the principal factor in causing this improvement. Except in Capiz, very few of the ordinary licensees were unable to cut the full amount granted them and in many instances, especially in Negros Occidental, additional amounts were asked for, and granted. Of the two large mills in northern Negros one has been running its two mills with two shifts continuously since September and the other increased the length of its day shift by two hours, during the latter part of the year. Also, the mill at Asia increased its logging equipment by installing an overhead cable system for transporting logs and should be able to double its previous output this coming year.

There were one hundred and fifty-four commercial timber licenses in force this year as against 137 in 1923. Thirty-one of these areas were inspected as against 22 in the previous year.

Of gratuitous timber licenses 204 were issued as against 167 in 1923, an increase of 37.

Eighty-six caiñgin makers were detected during the year, 58 of which were convicted, 4 acquitted, 6 were withdrawn, 5 submitted to administrative action, i. e., paid the fines imposed administratively and 11 cases are still pending.

Forty-six special use permits were granted as against 21 during previous years. Of this number 26 were granted in Iloilo.

During 1924, nine hundred and thirty-three public-land applications were received which, with eleven applications pending

from 1923, made a total of 944. Of these 441 were inspected and reported on during the year leaving a total of 503 pending. This work has kept the personnel of the district busy to the detriment of other lines of forestry work.

District No. 13: Headquarters, Cebu, Cebu.—Provinces: Agusan, Bohol, Bukidnon, Negros Oriental, Cebu, and Zamboanga (northern part). Area: 20,531 square miles.

The demand for lumber this year has been better than in 1923, particularly in the Provinces of Agusan, Surigao, and Cebu. This applies to the smaller timber licensees as well as to the large sawmill companies and has been due to good price in conjunction with good crops and the demand from sugar centrals.

During the year there were issued 171 timber licenses, compared with 174 in 1923. Only thirty-one of these areas were inspected due to lack of personnel. The number of minor product licenses granted was 302 an excess of 18 over 1923. There were also issued 1,110 gratuitous timber licenses, these being mainly used for the cutting and invoicing of house posts and heavier timbers, the sawn lumber being obtained chiefly from the sawmills. A new sawmill has been installed during the year by the Abaya Lumber Co. in Momungan, Lanao, capacity 4,000 board feet daily. The Solanan Lumber Co. formerly the Cagayan Lumber Co., after experimenting with carabao logging, have decided to install a tramway, as they were unable to keep their mill supplied with logs.

The Pangasihan Lumber Co. have begun the installation of a mill in Gingoog, Misamis, but have not yet finished it.

Other improvements in the district are the construction by the Kolambugan Lumber and Development Co. of a 150-foot tunnel on their logging railway and the installation of a 120-horse power boiler by the Misamis Lumber Co.

In addition to 613 public-land applications pending examination at the end of 1923, there were 337 new ones received during this year. Of this number, 628 were inspected, leaving 424 pending at the end of the year.

There were 379 cases of illegal caiñgins detected during the year, of which 89 were let off with a warning, 120 were prosecuted and convicted and 10 acquitted. Thirteen were fined administratively and the balance are pending action. This is a very bad showing and indicates that in the heavily populated districts the present caiñgin laws are not sufficiently severe to a stop to this evil.

FOREST DISTRICT OF MINDANAO AND SULU

[Headquarters: Zamboanga, Zamboanga. It includes Administrative District No. 8]

District No. 8: Headquarters, Zamboanga, Zamboanga.—Provinces: Cotabato, Davao, Jolo, Zamboanga (except Dapitan and Dipolog), and southern Lanao. Area: 22,576 squares miles.

District No. 8 was in slightly better shape as to the number of personnel this year than last, as it had one district forester, one assistant district forester, one lumber grader and one assistant grader, seventeen rangers, nine forest and concession guards and one clerk, a total of 31 men. Last year there was no assistant district forester, no assistant grader and one less ranger. Despite the increase in personnel, however, there was no real improvement, as the increase amount of work to be performed more than offset the gain in personnel. Owing to the steadily increasing influx of settlers, the call for land inspection is becoming greater all the time, and the increased business of the sawmills has entailed more concentrated work on the part of the rangers at the scaling station and a consequent reduction of their work in other lines. The increased call for grading inspection alone took the entire time of one man and the indications are that this work will increase very rapidly, as the mill-men who have had this class of work done are very well pleased with the results.

The price of lumber has been good and the sawmills have been able to move all the lumber that they could cut.

The progress away from the old hand-logging system, toward the development of a rational exploitation of the different concessions has not been as rapid as had been hoped, due undoubtedly in most operations, to a lack of capital. However, the Port Banga Mill has completed a logging incline, and has also installed 1½ kilometers of gravity railroad, both of which are now in operation, and have ordered another donkey engine; the Olutanga Sawmill has started construction of a logging railroad and has installed a resaw and an additional boiler; the Basilan Company has had a very prosperous year and expect soon to be able to put in the necessary railroad equipment; the Mindanao Lumber Co. has put in two light railroads with 20-pound rails, aggregating about four kilometers in length; Port Lebak has also installed a short line of rails, which supplies about half the timber cut by their mill and has ordered a big donkey engine, so the production at this mill may be expected soon to show a material increase; the Milbuk Timber Co. has

also started to lay rails and expect soon to be getting practically all their logs by this route.

Taken as a whole therefore, the outlook is bright for the future of the mills in southern Mindanao.

Although the 1923–24 dry season was one of the driest ever experienced here, and grass fires were very numerous and severe, but little damage was done to virgin timber.

During the past year, there were issued 80 ordinary timber licenses, 53 private gratuitous timber licenses, 11 public gratuitous timber licenses, 11 pasture permits, and 143 ordinary minor product licenses. There were in effect also 5 concession licenses, making a total of 303 licenses issued during the year.

One land classification party composed of six rangers has been working for several months in the Cotabato District; owing to the enormous area to be covered, however, they have scarcely done more than make a start. It is a start in the right direction, however, as this work will in time relieve the district personnel of the tedious inspection of individual land applications and will be the basis for the development of a permanent scientific administration of the forest lands.

There has been little attempt at enforcing the game laws during the past year as the Bureau's personnel cannot begin to perform all the strictly forestry work and furthermore there is no general public opinion in favor of such enforcement. The one place where the game laws should be enforced is in the Liguasan swamp in the Cotabato valley. Here the variety and abundance of bird life is wonderful and it would make an excellent game preserve, prohibiting the killing of any bird except the members of the duck family.

DIVISION OF INVESTIGATION

RECONNAISSANCE

The reconnaissance during the dry season of this year was held on the Calamba Estate Addition which is a portion of the Friar Lands Estate assigned to this division for management. The reconnaissance of the Makiling National Botanic Garden was finished in 1922 and the completion of the work on the Calamba Estate comprises all lands in this region which are under the jurisdiction of the Division of Investigation.

The Calamba Estate is bounded on the north by private land, on the east by the Dampalit and Molawin Blocks, on the south by the Dipangla Block and private land, and on the west by a portion of the Calamba Estate Addition which was declared

agricultural land and placed under the jurisdiction of the Bureau of Lands.

Some monuments on the Calamba Estate are apparently misplaced as the boundary survey did not tie in with them. A resurvey of the boundary of the entire Makiling National Botanic Garden is essential and should be made as soon as possible by a certified surveyor of the Bureau of Lands.

The topography of the Calamba Estate is similar to that of the Dipangla Block, the portion between Tigbi and Sulsuguin creeks being very rough.

The average stand per hectare is 49.6 cubic meters or about 83 trees per hectare. Seventy-nine and forty-four hundreths hectares of valuation survey were taken. This is a 10 per cent estimate. The total number of trees on the Commercial area is approximately 63,492, divided as follows:

First group	2,759
Second group	8,157
Third group	7,882
Fourth group	44,694

The total volume on the commercial area is approximately 37,860 cubic meters.

The following tabulation shows the areas of the vegetative types:

	Hectares
Noncommercial mossy forest	13.39
Commercial mid-mountain forest	90.68
Commercial culled dipterocarp forest	672.85
Noncommercial culled dipterocarp forest	8.77
Cogon and open land	76.07
Cultivated	96.72
Total	958.48

The above table shows that about 760 hectares are commercial forests. The large amount of cultivated land is due to the fact that considerable of the area is agricultural and has been granted to squatters on caiñgin permits under our reforestation system. During the year three licensees were operating in this area, one being for white earth, one for timber and one for firewood.

The stand on the area is poor. Certain portions of the area are agricultural land as mentioned above while others are absolute forest land. It is recommended that when the status of this area is finally decided upon, those areas which are purely forest land should be incorporated as a part of the National Botanic Garden.

The reconnaissance was made by the students of the Class 1925 under the supervision of one forester and three rangers with three forest guards assisting when necessary. The usual valuation notes of the timber were taken as well as distances and elevations in order to prepare a complete map and stand tables of the area. The maps have been completed and the final tables are ready for typewriting. These will be included with the report of the Makiling National Botanic Garden Reconnaissance which will be submitted in 1925. The strips were 200 meters apart and 20 meters in width. This method was used as experience has shown that it gives a better estimate and topographical notes than to follow creeks, ridges, and trails.

The approximate cost of field work on the Calamba Estate was ₱0.91 per hectare. The work of compiling the stand tables and making the maps was done at the School of Forestry.

The base line and transit survey was done by Forester Luis R. Salvosa who was in charge of the reconnaissance. The identification of species was under the supervision of Rangers Felipe Salvoza and Mamerto Sulit and the timber estimate under Ranger Seguerra.

One deplorable incident which occurred was the death of Pensionado Arizabal. This was due to heart trouble.

A reconnaissance is being planned for the Class of 1926 and it is recommended that it be held on the Mount Banahao–San Cristobal Forest Reserve as this area should be covered as soon as possible and put under our caiñgin system of reforestation.

DENDROLOGY

In addition to instruction in this subject in the school, the following work was done during the year.

(*a*) Compilation of data for a proposed dictionary of flowering plants in the Makiling National Botanic Garden. This is not yet completed but is partly finished.

(*b*) Ranger Felipe Salvoza has started an investigation and the collection of the more important lianas on the mountain.

(*c*) Botanical collection was extended to Paete, Laguna, and Polillo Island, Tayabas. The species collected numbered 154; 41 of which were from Paete and 113 from Polillo. These were sent to the Bureau of Science for identification but so far no list has been received by this division.

(*d*) The cataloguing of the plants in the Arboretum and

Campus was completed by the rangers in charge of Dendrology and Silviculture.

(*e*) The specimens in the herbarium have been arranged according to the systematic nomenclature of Engler and Prantl, from the family Cycadaceae to the family Compositae. Further, each genus was filed in a separate folder and all species in the genus were arranged in alphabetical order so that it is possible to find a specimen on short notice. The number of specimens in the herbarium is now 3,025, representing 117 families, 559 genera, and 1,295 species.

(*f*) Botanical exchange is being carried on with various entities especially Mr. W. E. Brunner of the Department of Botany of the University of Oklahoma. A collection of 50 species of economic importance is now ready for shipment to him. Other collections are being prepared to be sent to various parts of the world.

UTILIZATION

(*a*) LUMBERING

Very little work of an investigative nature in this subject has been done during the year inasmuch as one Forester was absent on leave for five months and one forest supervisor, who has been assigned part time to this work, is at present in the United States. Some of this investigative work is carried on by the Division of Sawmills and Utilization.

The trip to Paete in connection with the instruction work in the School of Forestry furnished us some valuable information regarding the minor wood-using industries of that town. Over fifty blue prints and tracings of logging and sawmill machinery were added to our files during the year which are very valuable for reference and instruction.

The division still continues to receive sawmill reports from various parts of the Islands which are also used in our work.

(*b*) MINOR FOREST PRODUCTS

(*1*) *Charcoal*

The two kilns, one commercial and the other experimental have been in continuous operation since 1921 and it is hoped that they will last for at least two more years although they are getting old. Different species were burned in the small kiln and the large one was generally used for mixed charges.

The following summary shows the results of this year's operation:

	Small kiln	Large kiln
Number of charges	20	14
Number of cubic meters of wood used	24	126
Number of cubic meters of charcoal produced	6.85	40.83
Average per cent of utilization	28.55	32.40
Number of rice sacks of charcoal obtained	95.5	575.00
Number of kilos of charcoal obtained	1,331.5	8,652.50
Average number of rice sacks per charge	4.7	41.00
Average weight per sack in kilos	14.0	15.00
Approximate cost of producing one kilo	.02	.08
Approximate cost of producing one cubic meter	₱35.34	₱16.94

Nine thousand nine hundred and eighty-four kilos of charcoal were produced during the year of which 6,564 kilos were sold. Thus far ₱282.75 have been collected from the sale of charcoal.

Two laborers spend most of their time on the charcoal work especially in cutting timber for the kilns due to the fact that most of the available species in the vicinity have been used up and it is necessary to go some distance into the forest to secure sufficient material.

(2) Other Products

The work of investigation on minor forest products has been continued this year in so far as personnel and time have permitted.

A considerable collection of fibers, basts, etc., of economic forest species from Mount Makiling has been secured. This is being manufactured into various articles, such as rope, baskets, bags, slippers, etc., for exhibition purposes, the idea being to show possible uses of these products.

FOREST ENGINEERING

No particular investigative work in this line was done this year, the personnel being fully occupied in instruction work. The hut on the top of mountain was completely built and is now in good shape and can be used by parties desiring to stay overnight on the mountain.

In connection with the class work the plane table map of the campus and plantations was continued and a small area added. Some of the trails have been resurveyed. The maps in connection with Calamba Estate Reconnaissance have been completed and a complete map of the Makiling National Botanic Garden and Calamba Estate Addition is at present under preparation. This will show topography, vegetation, roads, trails, camps, buildings, white earth deposits, reforestation areas, etc.

FOREST MANAGEMENT

(*a*) GROWTH STUDIES

The annual measurement of the 590 trees comprising eight commercial species on Mount Makiling was made during the months of August and September. This makes the eleventh year that these measurements have been taken and they have all been compiled in tabular form. Copies of these tables have been sent to Forest Supervisor Carlos Sulit at the Yale Forest School so that if time permits they may be worked up in connection with his research work in forest mensuration. This procedure was followed due to the fact that Mr. Sulit was in charge of this work for a number of years.

The pure Bagtikan stand near the School of Forestry was also measured as usual.

All the trees in the plantations were measured in June, diameter only being taken as the trees are now too high to make the taking of heights practicable.

Measurements were also taken in some of the reforested caingins.

The division lacks measurements of some commercial species such as yakal, palosapis, apitong, tangile, and many others which are not in our plantations. If possible sample plots should be established in districts where these species occur and annual measurements made and submitted to this division.

(*b*) TIMBER ESTIMATES

Valuation surveys were taken in connection with the reconnaissance on the Calamba Estate Addition. These have been compiled in stand and stock tables and are now ready for typewriting.

(*c*) VOLUME TABLES

Measurements of Benguet pine which are suitable for the compilation of a volume table have been received and will be worked up in our next class in forest mensuration.

In this connection, instructions have been sent to the entire field force, especially to those in the Division of Sawmills and Utilization, requesting them to record measurements of felled trees and submit to this Office. The need of reliable volume tables of Philippine species has been apparent for many years and steps should be taken to compile them as rapidly as possible. The measurements of two or three hundred trees of a species

is not sufficient to give reliable results and at least one thousand should be secured before these tables are started.

(*d*) WORKING PLANS

Since the compilation of the reconnaissance data of the Makiling National Botanic Garden and the completion of the stand and stock tables it has been possible to regulate to some extent the cutting of timber in the different blocks. No license or gratuitous permits were granted for any timber on the mountain unless the stand and stock table showed that there was sufficient in the area so that some trees would be left. It is possible, that with the addition of growth figures, some simple method of regulating yield in tropical forests may be devised. Experience here has shown that it is possible to control the cutting of a forest area providing reliable tables are available. This method can be applied to other forests in the Philippines if a good timber estimate is made.

No work in the compartments has been done this year due to lack of personnel. If possible this will be continued in 1925 in connection with our instruction in forest management. The preparation of the working plan for Mount Makiling has been delayed due to lack of information regarding the silvicultural conditions of some portions of the forest. This is now being collected and compiled.

Due to the absence of Forest Supervisor Carlos Sulit, the work in forest management has been seriously handicapped, as two of the personnel are doing the work which was formerly carried by three men.

SILVICULTURE

(*a*) REFORESTATION

In carrying on the reforestation work this year the policy as outlined in 1922 was followed as closely as possible.

The need for reforestation is realized and the division is being called upon more and more to handle new projects. During the year 1924 the need of additional men and funds was felt very keenly. Some of the projects started a few years ago had to be stopped due to this lack of funds and personnel.

Ever since the Bureau of Forestry started to handle reforestation projects in all parts of the Islands, there has been no appropriation of money for this purpose with the exception of the ₱10,000 which was appropriated in 1916 for work inside the Talisay-Minglanilla Friar Lands Estate in Cebu. All other funds used on reforestation work have been drawn from the

general allotment of the Bureau. During the year several requests were received by this Office for the inspection of areas intended for reforestation by private individuals as well as haciendas and companies. This indicates a growing appreciation by the people of the importance of reforestation and of planting for fuel supply. It is expected that next year more of these requests will be received. It is almost certain that these can not be attended to properly nor good results secured unless this lack of funds and personnel is met in some manner.

The reforestation force is at present composed of one forester who is in charge of the project and is also district forester and carrying a heavy teaching schedule in the School of Forestry, one ranger who is on planting work in the Makiling National Botanic Garden, and one Ranger who is in charge of the work in the Talisay-Minglanilla Friar Lands Estate and in the Visayas. One ranger has spent part time on the Ilocos projects. One forest supervisor formerly connected with this work was sent to the United States as Government pensionado.

(1) *Ilocos Reforestation*

During the year the work in the Ilocos provinces was a continuation of the projects started in past years. This was under the supervision of Ranger Francisco L. Rola of the Vigan Forest Station.

(*a*) *Vigan, Ilocos Sur.*—The planting was done on July 9 and 10, 1924. The total area planted was about 0.14 hectare. The total number of seedlings planted was 760, composed of molave, narra, and tindalo. These were grown in the nursery at Caniaw, Vigan.

In the nursery at Caniaw, Vigan, there are 12,700 seedlings available for planting next year.

(*b*) *Santa, Ilocos Sur.*—About one third hectare was planted and it lies just east of the area planted with Teak last year. The species planted consisted of the following:

	Seedlings
Molave	1,100
Narra	130
Supa	207
Tindalo	140
Total	1,577

These were planted on July 10, 1924, at a cost of ₱8.93 per 1,000 seedlings.

(*c*) *Sarrat, Ilocos Norte.*—During the year, there was no planting done in Sarrat, Ilocos Norte. The demonstration plot, however, was inspected on March 22, 1924, by Ranger Rola.

During the inspection, it was found that there were a few ipil-ipil trees having a diameter of about seven centimeters and several from two to five. A small portion of the plot was burned in February, 1924, but the seedlings at the time of inspection were beginning to send out sprouts.

(*d*) *Laoag, Ilocos Norte.*—The plot of Laoag was inspected on March 21, 1924, by Ranger Rola. Many of the ipil-ipil plants had diameters ranging from three to six centimeters. A small portion of the plot was also burned over probably in February, but many of the seedlings were sending out sprouts at the time of inspection.

(*e*) *Currimao, Ilocos Norte.*—In the report for last year, it was mentioned that this Office was trying to arouse public interest, particularly among the land owners in Currimao, whose lands are affected by the sand dunes, in the reforestation of these dunes. During the year great efforts were made to get this project under way, but it appears that the importance of this piece of work has not as yet been realized by the people. Efforts will again be exerted next year to educate the people along this line until they realize the needs of reforesting the sand dunes which are annually destroying a large part of their rice fields.

The importance of reforestation as a whole is appreciated by the people of the Ilocos provinces, therefore the Bureau should endeavor to push the work as fast as practicable.

(2) *Zambales Reforestation*

During the year there was no planting done in Zambales. The project at San Felipe, however, was inspected in May, 1924. During the inspection the following points were noted:

(*a*) The planting last year of forest tree seedlings was a failure. The main reason for this was that the planting was done rather late in the rainy season.

(*b*) The ipil-ipil trees resulting from the first planting were in excellent condition. They had an average diameter of about 5 centimeters and were in fruit.

(*c*) The areas planted had not been burned over, altho animals were allowed to graze on them.

(*d*) There were about 1,000 molave seedlings left in the nursery. Unfortunately these were not planted this year.

(*e*) The people were very much interested in the work and those who had voluntarily helped us in past years have again expressed their willingness to coöperate with the Bureau.

Although the first planting of forest tree seedlings was a failure, yet it is recommended that the work be continued. The people have not in the least changed their attitude to and interest in the work.

(3) *Cebu Reforestation*

The work performed in the Province of Cebu consisted of the continuation of the planting in the Talisay-Minglanilla Reforestation Project, the inspection of the Osmeña Waterworks, and of the lands belonging to the Uling-Naga Coal Company, Naga, Cebu.

(*a*) *Talisay-Minglanilla Reforestation Project.*—The planting work this year in the Talisay-Minglanilla Reforestation Project followed closely the planting plan and policy outlined in 1923. The work accomplished during the year shows what coöperation can do. The squatters have agreed to the following conditions:

(1) The *caiñginero* should give annually two gantas of ipil-ipil seed to the Bureau of Forestry for each hectare of land he cultivates.

(2) The *caiñginero* should plant trees six days every year for each hectare of caiñgin he occupies.

(3) The *caiñginero* should take care of a small temporary nursery in his caiñgin which will furnish him seedlings for planting cogon areas adjoining his caiñgin.

With the *caiñgineros* as laborers, there were 19,300 seedlings transplanted to seed beds in the nursery: 12,300 seedlings set out in plowed areas in the plantations; 500 seeds of ipil sown directly in the plantation, and 200 meters of road, constructed.

In addition to this, a forest nursery was established at Camp No. 7, and a nursery house is now under construction.

(*b*) *Watershed of the Osmeña Waterworks, Cebu, Cebu.*—In compliance with a request received from the Bureau of Public Works, the watershed of the Osmeña Waterworks was inspected on May 24, 1924, by the forester in charge of reforestation projects in company with Engineers Quisumbing and Segura of the requesting Bureau. During the inspection, the following points were noted:

(1) The reservoir was badly silted up so that a number of laborers was kept busy removing the silt.

(2) There was very little water in the reservoir, and it could not supply the needs of the town of Cebu at that time.

(3) The main stream together with the smaller ones which supply the reservoir with water were thoroughly dry.

(4) There was found a fairly good vegetative cover at the immediate border of the reservoir. Ipil-ipil was abundant and the scrubby vegetation was composed largely of nangka, santol, bangkal, bamboos, and miscellaneous ficus spp.

(5) The mountain side at the source of the streams were covered with cogon and practically devoid of tree vegetation.

(6) A large portion of the scrubby vegetation at the right side of the reservoir and the cogon areas at the sources of the streams had been burned over.

A detailed report of the inspection together with a proposed planting plan was submitted to the Director of Public Works.

(*c*) *Uling-Naga Coal Company, Naga, Cebu.*—Upon the request of the Uling-Naga Coal Company, the area proposed to be reforested was inspected by the forester in charge of reforestation projects in May, 1924. A detailed report of the inspection together with a planting plan was submitted to the company for its guidance. This Office has already forwarded two liters of Swietenia macrophylla, three liters of molave, and three liters of madre cacao seeds to the company through the Ranger in charge of reforestation at Cebu.

(4) *Makiling Reforestation*

The reforestation work carried on this year was a continuation of the plan laid out in 1922 in which caingin labor was used. No new area was added to the plantation as the work was confined to filling-in gaps and cleaning.

The total number of labor days registered was 819. Of this number, 316 were used for cleaning, 109 for planting and 59 for miscellaneous nursery work. The remaining 335 labor days are now being used in cleaning the planted areas.

During the year, there were 19,378 seedlings used in filling-in gaps at an average cost of ₱6.72 per 1,000 seedlings. The cost of planting the same amount last year was ₱8.64.

In the earlier part of the year the greater portion of Area II was burned over.

(5) *Pangasinan Reforestation*

During the year, no planting was done in the Hacienda Esperanza with the coöperation of the Bureau, nor was there any planting done inside the communal forest of Labrador. The

municipal president of this municipality was, however, requested to see to it that animals are not allowed to graze on the planted areas as reported to this Office last year.

(6) *Salinas Reforestation*

During the year planting of ipil-ipil seed was carried on by the officer in charge, forest station, Bayombong, Nueva Vizcaya, inside the Salinas Forest Reserve. It is interesting to note that the Province of Nueva Vizcaya has appropriated ₱200 to help out the Bureau in this work.

The total area planted was 6.91 hectares with a total cost of ₱63.60. Of the 33 plots planted, eleven have the fire lines cleaned and partly plowed over.

Besides planting ipil-ipil seed, a number of bamboo stems have also been planted along the eastern side of the trail from the barrio of the salt-makers to the second creek going up to the salt springs. Some of these began sprouting on September 27, 1924, but a few were destroyed by wild pig and deer.

(7) *Isabela Reforestation*

The division superintendent of schools of Isabela has offered coöperation with the Bureau for the reforestation of the upper reaches of the Cagayan River. This Office has given him the necessary information regarding reforestation and has instructed the forest officers in Isabela to coöperate with him. Seeds of ipil, narra, molave, and tuai have been sent him through the forest officers in charge at Ilagan and Echague.

(8) *Leyte Reforestation*

The principal of the Baybay Agricultural School, Baybay, Leyte, has also offered coöperation with the Bureau in this line of work. This Office has requested the district forester at Tacloban, Leyte, to coöperate with him in this matter. Seeds of ipil, lumbang, molave, narra, palomaria de la playa, and tuai had been sent to the Baybay Agricultural School.

(9) *Other Projects*

No work was done on the following projects for the reasons given:

(*a*) *Agno River Valley.*—No definite action taken by the Government.

(*b*) *Corregidor Island.*—No inspection of the needs and recommendation were made as no definite steps were taken by the military authorities toward carrying the plans laid out last year.

(*c*) *Mount Arayat.*—No funds available.

All of the projects mentioned above are still unfinished and they should be continued next year. None of the urgent pending projects mentioned in previous reports has been started this year on account of the lack of funds and personnel.

(*b*) NURSERY

No additional area was added to the nursery this year as it was found sufficient for the planting stock required on the mountain and for distribution to other localities. Later when more space is needed it will be extended toward the charcoal kilns. The old nursery in Hectares D and F was abandoned for such purpose and turned into an arboretum. However, a very small portion of this area is still used as a propagating bed for cuttings of ornamental plants. Two of the nursery sheds which were leaking badly have been reroofed with nipa.

The following stock is on hand in the nursery at the end of the year:

Timber species	14,143
Ornamental species	7,895
Orchids, ferns, etc	117
Total	22,155

Of the above, none of the orchids are available for distribution and 43 of the ornamental plants are likewise too rare to be disposed of at present. The total number of species in the nursery at the end of the year is considerably less than it was in 1922 or 1923 for the reason that a large amount of planting was done in various open areas adjacent to the school and considerable stock was disposed of by sale and free distribution.

(*c*) ARBORETUM

The arboretum has been increased by the addition of that portion of Hectares D and F which was formerly used as a nursery. This area was not sufficiently level for a good nursery site and was therefore abandoned. Inasmuch as there is a goodly number of tree species on the area it was considered better to add it to the arboretum as it is close to the campus and easily accessible to visitors. The construction of the new trail along the Molawin creek gives an additional area on the east bank of the creek for arboretum purposes. The large gulley in Hectares D and F has been planted with species which are subject to windfall.

A total of 551 plants were set out in the arboretum and this added to the number reported last year (702) gives a total at the end of this year of 1,253. Many of these are exotic species.

(*d*) SEED COLLECTION AND DISTRIBUTION

About 2,940 liters of seed were received of which 2,905 were from Philippine sources and the remainder from foreign countries. This is considerably in excess of the amount collected in 1923 and 1924 and this increase is very gratifying to this Office. However, the field force should be urged to greater efforts as the demand for seed, especially from outside sources is increasing rapidly. Of the above 2,940 liters of seed, 1,920 liters were collected by the personnel of the Division of Investigation from the plantations and the forest.

The seeds received from foreign sources were heartily appreciated as it added some palms and other economic trees to our collections. Some interesting species were received from Hawaii.

Seeds distribution was as follows:

	Liters
In the Philippines	1,745
To foreign sources	52
Sold	7
Total	1,804

Of the remaining 1,136 liters, 225 were sown in our nursery, 905 are on hand and 6 were condemned.

(*e*) PLANT ACCESSION AND DISTRIBUTION

Four hundred and sixteen plants were received during the year of which 318 were from Philippines and 98 from foreign sources.

The exotics were from the following countries:

Hawaii	93
United States	2
Japan	3
Total	98

A number of interesting ornamentals were received from Honolulu but unfortunately many of them had labels giving the color of the flowers only. Among these were various forms of Frangi pangi (calachouchi), which are not found in the Islands. Among the interesting plants from other foreign countries are *Strychnos nux vomica, Cartuza urens* (Wine-Palm), *Cinnamomum zeylanicum,* and two species of Phoenix.

A total of 7,620 plants were distributed throughout the year. Of these 2,419 were timber species and 5,201 ornamental and of the latter 775 were sold the amount received being ₱66.89.

The plants distributed do not include those used in the Makiling Reforestation.

(*f*) PLANTATION

The School of Forestry plantations have been cleared during the months of August to December, inclusive. This work was done by student labor and an approximate area of 24 hectares was cleared at a total cost of ₱232.50 or an average of ₱9.61 per hectare. This is very reasonable considering the fact that these plantations have not been cleared for some time and the growth of the underbrush is very rapid. All the tall grass and underbrush in the plantation rides was cut in December.

The failed places in some hectares of the plantations were planted with economic species, in all a total of 4,240 being set out. Twenty-six trees were cut or blown down in the plantations during the year. They had an approximate volume of 8 cubic meters. It was necessary to cut some of these trees in order to make room for buildings but the majority were blown down during the typhoon.

(*g*) STUDIES

(1) The study of the behavior of malaruhat under a dense stand of ipil-ipil which was started in 1922, was continued. In a report submitted about the end of the year the following points were mentioned:

(*a*) That Eugenia bordenii has a relatively high percentage of success when planted under a dense stand of ipil-ipil. The percent of living plants is 77 or a reduction of 8.25 per cent of the total number found living six months after planting.

(*b*) That the total number of seedlings that made positive growth was increased by 40 plants.

(*c*) That the total number of seedlings that made negative growth, or had their tops dead was decreased by 45 plants.

(*d*) That the total number of seedlings that made no growth was decreased by 28 plants.

(*e*) That the number of dead seedlings has increased by 33 plants.

(*f*) That the average net growth was 4.02 centimeters.

(*g*) That the average height of all living plants is 43.37 centimeters or a total average growth of 5.11 centimeters since the seedlings were planted one and a half years ago.

(*h*) That the decrease of the number of living plants was due to the fact that many of the plants at the time of inspection on January 20, 1923, were not yet well established.

(*i*) That about 50 per cent of the plants that had their tops dead, resulting from transplanting, have recovered and made rapid growth.

(*j*) That about 38 per cent of the plants that had made no growth in the past had also recovered and made rapid growth.

(*k*) That Eugenia bordenii is a hardy species for field planting and that it can bear a certain amount of shade.

It remains still, however, to determine how long and to what size or age does Eugenia bordenii keep its tolerance under a dense canopy.

The next measurement of the plot will be made in January, 1925. It is believed that in the future there will be new points brought to light concerning the life and behavior of Eugenia bordenii. For this reason the work will be continued as long as valuable data can be obtained.

(2) A considerable number of drawings of the seedlings stages of important Philippine trees was completed this year. These will form the basis of a valuable publication in the future when sufficient have been made. Other silvical data will be added regarding these species as well as dendrological characters and wood structure.

(3) Germination tests of various species have been continued as well as experiments to determine the number of seeds per liter, kilogram, etc.

WOOD TECHNOLOGY

(*a*) DURABILITY TEST

The usual annual inspection of the durability test specimens was made in September. This experiment was started in 1905 thus making this the nineteenth year it has been carried on. Some of the original test specimens are still in fair condition.

Thirty-two specimens of commercial Philippine woods representing seven species, namely, bagtikan, almon, white lauan, red lauan, guijo, palosapis, and lumbayau were painted with Bitumastic paint and buried in the testing ground. This paint is manufactured by the Wakes-Dove-Hermiston Corporation of

New York City. One piece of each species was left unpainted as a check. The purpose of this test is to determine the value of this paint as a preventive of decay and termite attack.

(*b*) WOOD COLLECTION

No new material was added to the wood collection. The number of specimens in this collection remains the same as that reported in 1922, namely, 1,756. These represent 112 families and 924 species.

There are also 204 specimens on the display rack in the classroom representing 44 families and 199 species. The wood collection contains 481 foreign specimens which represent 45 families and 459 species.

FOREST ENTOMOLOGY AND FOREST PATHOLOGY

(*a*) FOREST ENTOMOLOGY

Very little work was done in this subject during the year. Some collections were made by the personnel of this division, while in the field, especially those men in the Bukidnon Land Classification Party. Some material was also secured from Polillo Island and Paete.

One of the rangers conducted a series of breeding experiments in the nursery at Los Baños, the results of which were sent to the Department of Entomology of the College of Agriculture. Thus far no report has been received on this work.

(*b*) FOREST PATHOLOGY

No work of any sort was done in this subject during the year due to the fact that the personnel in charge of this work at the College of Agriculture was too busy with regular courses to give us any assistance. Collections of the more important timber destroying fungi together with specimens showing the damage done should be made, especially by the field force. However, there is no place at present to store this material, which is bulky.

PUBLICATIONS AND PROPAGANDA

(*a*) PUBLICATION

The only publication issued this year was Volume III of the Makiling Echo which consisted of one double number and two single numbers. This has a continually increasing circulation and is meeting with favorable comment from many entities. If possible this publication should be printed rather than mimeographed as it would present a much neater appearance. How-

ever, this can not be done unless subscription charges are made, and some advertising secured. At present each issue of the Echo is limited to 500 copies.

The division is gradually accumulating information of value which should be worked up as rapidly as possible and published. So much of the time of the personnel of this division is spent in routine work and instruction that they have no time in which to prepare material for publication. During the year articles have been furnished to various newspapers by some of the division personnel as well as by other divisions of the bureau.

(*b*) PROPAGANDA

As much propaganda work as possible, especially in connection with the public schools, is carried on by the various members of this division. Several of the rangers gave talks on Arbor Day at various schools in Laguna. This is a phase of forestry work which should be strongly developed in the future.

IMPROVEMENTS AND EQUIPMENT

(*a*) IMPROVEMENTS

Several improvements of note were made during the year. These are mentioned in the portion of this report, under the heading "School of Forestry."

(*b*) EQUIPMENT

Some equipment was received from both the Bureau and University. Notable among these are the following:

1 barograph.
1 thermograph.
1 laboratory scale.
4 soil thermometers.
Books for the Library.
Medical equipment.
2 Dissecting microscopes.

ADMINISTRATION

(*a*) PERSONNEL

The present force of this division consists of one chief, and three additional foresters, one of whom is also district forester of South Central Luzon. There are three forest supervisors, one senior ranger and six rangers in the division. In addition there are one clerk, nine forest guards, six forest nurserymen, and seven laborers. One of these guards is employed in the Cebu Reforestation. During the year one forest supervisor was sent to the United States as a pensionado and one ranger was transferred to the Division of Sawmills and Utilization. One clerk resigned and left for the United States.

As mentioned in previous reports and in the personnel report of this division for 1924, the present force is not sufficient to handle the work of this division. Only such research work as was started has been continued and some projects both old and new have been held up for lack of time and personnel. With the heavy instruction work carried in the school and the limited number of men, work which should have been started years ago is still held in abeyance. What is needed is more personnel properly trained to handle scientific investigation. Or else additional instructors should be provided to handle the school work leaving some personnel who may spend all of their time in investigative work. Furthermore the ordinary routine work of the division demands considerable of the men's time.

(*b*) MAKILING NATIONAL BOTANIC GARDEN (INCLUDING CALAMBA ESTATE ADDITION)

(1) *Licenses.*—During the year several new licenses were issued within the Makiling National Botanic Garden and Calamba Estate Addition. These were mostly for such species as malapapaya, gubas, malasapsap, and similar species which furnish a light soft wood suitable for the manufacture of wooden shoes. It was found that there was an abundance of these species which were overmature and in those areas where they occurred in greater quantity than was needed they were cut by these licensees, some being left for seed trees.

During the year the following licenses were in force:

Kind		Number	Amount
Timber	cubic meters	5	580
Firewood	cubic meters	5	1,060
Charcoal	cubic meters	1	50
White Earth	kilos	1	60,000

Also one pasture permit was issued. No commercial licenses except those for white earth and charcoal have been approved, two for white earth and one for charcoal.

(2) *Gratuitous permits.*—During the year 72 gratuitous permits were issued; 50 being for timber for personal use and 47 for minor forest products of various sorts. The total amount of timber granted under these gratuitous permits is 120.96 cubic meters of which 18.02 cubic meters was second group timber; 6.60 cubic meters, third group; 96.34 cubic meters, fourth group. No first group timber is given under gratuitous permit.

One thousand five hundred and ninety-nine kilos of minor forest products were given under gratuitous permit consisting mainly of rattan, hingiw, kamagsa, cabonegro, moss, ferns, etc.

(3) *Kaiñgin permits.*—During the year 178 kaiñgin permits were issued to inhabitants of the adjoining municipalities. In no case was a permit given without the holder being required to sign a contract for work in connection with our reforestation program. Most of these permits were renewals of areas which have been granted in previous years. A few new kaiñgin permits were given as some areas fitted for reforestation are in need of clearing. The following table shows the number of kaiñgin contracts, the number of hectares cultivated in kaiñgins and the number of hectares reforested for the years, 1922, 1923, and 1924:

Year	Number of kaiñgin contracts	Number of hectares cultivated	Number of hectares reforested
1922	243	254.16	18.05
1923	139	97.26	[a] 7.25
1924	178	119.19	[b] 14.9

[a] Part of original area of 1922 as only blank spaces were filled.
[b] Part of original area. The larger area in 1924 is due to the fire in Area II and more inter-planting was done in Areas III and III-A.

This Office expects to issue permits in 1925 in accordance with our reforestation program although all areas will be carefully inspected before permit is issued. There is a great demand on the part of the adjoining population for land for cultivation and unless a very strict supervision is exercised the entire lower slopes of Mount Makiling will be honeycombed with kaiñgins. Very few illegal kaiñgins, if any, occur within the boundaries of the Makiling National Botanic Garden and the Calamba Estate Addition.

The experience of the past three years has shown that kaiñgin making can be handled successfully in connection with reforestation projects. This requires an efficient ranger in charge of the work and sufficient guards to supervise the planting and inspect the kaiñgins. In no case should the *kaiñginero* be allowed to work on land which is absolutely forest. He should be restricted if possible to level land or in case of land which is rough he should be restricted to those low ridges which are more or less rounding and can be plowed or easily cultivated. This method has been very successful on Mount Makiling and is now being used in Cebu. *Kaiñginero* should be required to furnish a certain number of days labor for each hectare granted on permit as he pays no rent for the land.

(4) *Game.*—In accordance with Government regulation, no hunting has been allowed under permit within the boundaries

of the Makiling National Botanic Garden. Deer and wild pigs are numerous since the hunters have been restricted and there is large variety of bird life.

However, there has been considerable illegal hunting during the past year and this matter has been referred to the Philippine Constabulary, provincial governor, and municipal presidents, although there are still cases which have come to our attention. If a good patrol could be maintained on Sundays and holidays this illegal hunting would, to a great extent, be eliminated.

The subject of game protection is rapidly assuming importance in the Philippines as in isolated municipalities this is a source of food supply. Some instructions have been issued to the field force regarding the compilation of data relating to fish and game and this should be collected as soon as possible and sent to this Office for compilation. The matter of propagating upland game birds should be taken into consideration and some research carried on.

The information at present available regarding the status of fish and game in the Philippines is rather meager.

COÖPERATION

There has been more coöperation with entities outside of the Bureau than formerly. This is especially true in botanical collection and seed distribution. Considerable seed has been sent to other countries and some received. A number of requests for technical information were received and answered during the year. In most cases it was possible to furnish the information desired. In this connection attention is called to the fact that there is a decided need of further investigation and careful compilation of data that has already been gathered and not yet compiled.

The usual coöperation with the different departments of the Colleges of Agriculture and Veterinary Science has also been carried on.

THE WORK IN BAGUIO

THE FOREST NURSERY AT PACDAL

The main purpose of this nursery is to raise sufficient seedlings and transplants for reforestation and for beautification purposes in Baguio and vicinity, and for distribution.

The nursery has a total area of approximately ten hectares. The larger portion of it is used for transplants. Only about 932 square meters are used for seed and flower beds. The higher grounds are used for experimental plantations for exotic species.

The limited number of laborers who can be employed with the amount of money appropriated for the work this year made it necessary to confine the work to weeding, planting, and transplanting to a small portion. All the labor furnished by the City of Baguio was used in potting seedlings which were planted in the different reforestation areas in Lucban Hill and Busol Forest Reserve. In exchange for the plants furnished the Trinidad Agricultural School about five boys a week were sent us for six weeks during the rainy season. All their time was devoted to weeding and cleaning of plots and beds. The men of the Benguet Consolidated Mining Company were used entirely in potting seedlings for the reforestation areas in Apalan forest. Enough manure to fill the two big manure tanks was secured from the Camp John Hay stables.

Most of the seeds planted in the nursery were purchased from other countries. Many species of tree seeds have been ordered by the Mayor of the City of Baguio and are expected to arrive early in January. The pine seeds collected around Baguio are grown in the nursery for reforestation purposes. A little quantity of Japanese alder collected from the experimental plantations near the nursery is sown for the same purpose. These two species and Eucalyptus robusta makes the important reforestation material.

Among the plants found in the nursery on December 31, 1924, are the following:

Kind—Valuable for	Seedling	Cuttings	Transplants		Total
			Seed	Cut	
Reforestation	27,038	.....	1,330	.....	28,368
Park trees	3,514	1,616	10,020	1,885	17,035
Fruit or nuts	309	27	137	120	593
Other economic products	1,200	5,101	943	183	7,427
Hedges shrubbery	70	1,477	726	1,557	3,830
Miscellaneous	2,053	4,544	11,946	2,709	21,252
Total	34,184	12,765	25,102	6,454	78,505

The fact that there is no nursery in which plants needed for beautification in Baguio can be raised we are forced by circumstances to grow such plants, in coöperation with the city which purchase and furnish most of the seeds. Thuja orientalis and Cupressues fragrans are among the several exotics which grow well in Baguio and suitable for planting in parks and gardens. There are about 3,000 eight-month transplants of the former. Of the latter we have only 30 which live of several thousands of cuttings. For flowers the gladiolus of which we have six varieties (color) the strawflower (everlasting), about

a dozen varieties of dahlia, several varieties of carnations, and the hydrangeas (mil-flores) are the most successful.

Previous to November 12, 1923, all plants grown in the forest nursery at Baguio were given to the general public free of charge. After that date the Bureau of Forestry has to sell such trees, seedlings, and cuttings raised therein as are not needed for reforestation, beautification in Baguio, and other public planting. In accordance with the Administrative Circular No. 3, series of 1923, of the Bureau of Forestry, the amount of ₱269.48 was collected for plants sold. A large quantity of reforestation and beautification plants was given to Camp John Hay and to the Trinidad Agricultural School.

Up to the present time only that side of the nursery along the Gibraltar Road is protected by a wire fence. The main entrance is provided with a good gate. The other three sides remain open and very often animals grazing on the adjoining property walk into the nursery. If no money for additional fencing material will be available next year we may have to plant rows of century plants along the unprotected sides, but these will take two or three years to provide any protection.

As already stated, the limited appropriation makes it impossible to make any noticeable improvement. More than fifty per cent of the transplant plots have been rather neglected, the flower and transplant beds have been invaded by the weed grass which makes it very difficult for the number of laborers we have available to keep them weeded all the time. However, with the lumber and mesh-wire given us by the City of Baguio, we had been able to protect all the seedbeds used for germinating pines. And with the labor made available during December it was possible to clean some of the neglected plots, line with stones thirteen transplant beds, and prepare a new terrace north of Plots A, B, and C.

ECONOMIC PLANTS

About 230 two-year transplants of camphor are still in the nursery. Early in the year 540 one-year-old transplantation were planted in a coöperative experiment between the Bureaus of Science, Forestry and Education. In the analysis made by the Bureau of Science in October 1924, some of the 22 camphor trees planted around Baguio in or about 1911 have been found to contain either the commercial oil or resin.

The quinine plants (*Cinchona hybrida* and *C. Succirubra*) are now from 10 to 40 centimeters high. There are 317 of them living. It is our plan to plant some of them in the reserves and

to send many to different places in the Mountain Province for trial at different elevations. In January 1924, 320 transplants were sent to Trinidad Agricultural School. Very few of the plants are living.

Bunya pine or edible pine (*Araucaria bidwillii*) grows well. There are 139 seedlings ready for transplanting. The average height is 15 centimeters. On October 6, 1924, 12 seedlings were sent to the Semi-temperate Fruit Substations of the Bureau of Agriculture at Bontoc for trial. Some big plants of this species are found to be suffering from sun-scald.

Some coffee is grown in the nursery for distribution to the natives. There are 200 seedlings and 130 cuttings growing, now 10 to 30 centimeters high. In December about a *ganta* of seeds furnished by the Mayor of Baguio was sown.

The chesnuts (*Castanea* sp.) are now about 20 to 100 centimeters high. Many small trees of *Castanea koreaiensis* in the Forbes Forest Reserve are now from two to three meters high and some were observed to have fruited since 1920. One plant near the forest station was found with fruit last September and again last January. Many of the burrs contain no nuts.

The first cuttings of basket willow (*Salix multinervis*) planted in the nursery have grown large enough to allow new cuttings to be made. There are now about three thousand cuttings growing in the nursery and these can be set out in certain moist places in the reserves during the rainy season of 1925. If they succeed some material for basket making in which rattan is ordinarily employed may be obtained and in the future relieve some if not entirely the scarcity of rattan for weaving in this region.

For beautification we have among these already mentioned in this report thirty-six varieties of cannas which the City of Baguio imported from France. Of the *Acalypha hispida* cuttings received from the Division of Investigation 135 are living and promise to add some color to Baguio's evergreen.

PLAN TO PLANT FRUIT TREES

In the attempt to plant fruit trees in Baguio a few citrus were brought up to Baguio in 1923, but it is too early to say anything about their success. The Bunya pine which produces edible nuts is one of the species imported for planting. The seedlings are now big enough for transplanting.

REFORESTATION

For reforestation purposes it is intended to limit ourselves to Benguet pine, Japanese alder, and several species of eucalyptus

until other species are found suited to the climate of Baguio and its vicinity. New reforestation projects were started this year, all of which are in coöperation with the City of Baguio and the Benguet Consolidated Mining Company. The planting done is indicated in the following table:

Project	Date started	Present area	Species planted and amount	Remarks
		Hectares		
Lucban Hill	June 1, 1924	21	23, 150 pinus insularies and 548 alnus maritima	Coöperation with Baguio.
Camp 8, Baguio	July 1, 1924	2	2,048 eucalyptus robusta	Coöperation with Baguio.
Busol Forest Reserve	Sept. 4, 1924	2	2,850 eucalyptus robusta	Coöperation with Baguio.
Benguet Consolidated Mining Co., Apalan Mountain	June 1, 1924	7.33	14,220 pinus insularies, 350 alnus maritima	Coöperation with Benguet Consolidated Mining Co.

All the plants used in these projects were raised in the forest nursery. They were taken right out of the seed beds and placed in tin cans, and after two weeks or a month, they were planted in the field. All the planting was done during the last rainy season.

Pine and eucalyptus seedlings were given to the Trinidad Agricultural School to continue their reforestation work on the hills inside the property of the school. The planting at kilometers $6\frac{1}{2}$ on the Santo Tomas trail was temporarily abandoned on account of intensive grazing on the area. Of the 4,300 pines planted there in 1923 not more than 100 are living in spite of the extra care taken by placing stakes around the plants.

EXPERIMENTAL PLANTATIONS

No attention whatever was paid to the experimental plantations of exotics on the hill above the nursery. Only that of Japanese alder (*Alnus maritima*) does well. About a liter of seeds was collected from this plantation for further planting.

COÖPERATION WITH THE CITY

In February the position of the city forester was temporarily suspended and all the work which used to be under his office was assumed by the different departments of the city government. Coöperation in fire fighting in Baguio and its vicinity however was continued, and new coöperative reforestation projects described elsewhere in this report were started.

FOREST CONSERVATION

There is no doubt that the forest of Baguio must be preserved because of its peculiar aesthetic value to the city; it needs all the care and attention that we can give. Very little of the old forest remains but the demand on the forest increases.

The policy to reduce the cut in the vicinity of Baguio is adhered to closely and no trees are allowed to be cut unless absolutely necessary. In all cases only dead or dying trees are used and in a few places small trees which can be removed for improvement are cut. This policy is followed in all the reserves and unreserved public lands. Even lot owners generally get permission from the office of the District Forester before cutting any tree in their land.

STUDIES

The yearly measurement of the trees in the growth sample plots in Forbes Forest Reserve was changed to every five years. No measurement will be made until 1927. On October 1, 1924, a reproduction plot of 1,662 square meters was established in the cut-over area in Apalan forest of the Benguet Consolidated Mining Company. Only the heights of the seedlings of which there were 934 were taken. The plan is to take height measurement of the seedlings every year until the diameters can also be taken. What growth may have been made during the first year can be determined after the second measurement which will be made on October 1, 1925.

SCHOOL OF FORESTRY

ENROLLMENT

The school work started on January 2, following the Christmas vacation. The enrollment consisted of 25 seniors, one of whom was a pensionado of the British North Borneo Government and 23 juniors of whom two were British North Borneo pensionados. The senior class (Class of 1924) graduated on March 16.

The class of 1926 entered the school on April 2, with an enrollment of 21. Instruction in Botany I began on the same date. Six more students arrived later. During the summer term two students left the school. Two more were enrolled from the College of Agriculture to fill the vacant places. During the year the senior class (Class of 1925) was diminished by three as two members left on account of ill health and one died in the

summer term during the reconnaissance. This death was due to heart trouble. No contagious diseases with the exception of malaria occurred during the year. One of those who dropped out will return in 1925 to complete his work. One junior resigned and four were dropped on account of poor scholarship. The enrollment as of December 31 consists of 20 seniors and 22 juniors.

The following tabulation shows the enrollment of students by provinces, as of December 31, 1924:

Provinces	Seniors	Juniors	Total	Provinces	Seniors	Juniors	Total
Antique	.....	2	2	La Union	[a] 1	2	3
Benguet	1	1	2	Leyte	[a] 1	1	2
Bohol	1	.....	1	Manila	1	.....	1
Bontoc	1	.....	1	Misamis	.....	1	1
Bulacan	1	.....	1	Pampanga	1	....	1
Cagayan	3	1	4	Pangasinan	1	1	2
Camarines Sur	1	[b] 3	4	Rizal	.....	1	1
Capiz	1	1	2	Samar	1	.....	1
Cavite	.....	1	1	Sorsogon	2	.....	2
Cebu	1	.....	1	Tarlac	.....	1	1
Ilocos Norte	2	[a c] 2	4	Tayabas	.....	1	1
Ilocos Sur	.....	1	1				
Ifugao	.....	1	1	Total	20	22	42
Kalinga	.....	1	1				

[a] Borneo pensionados.
[b] One junior from Camarines Sur is a private student.
[c] One junior from Ilocos Norte is a Borneo pensionado.

FACULTY

The following changes have taken place in the Faculty during the year.

(*a*) Additions.

BARNEY A. SARECKY
Assistant Professor of English.

(*b*) Separations.

CLARENCE A. NEFF
Assistant Professor of English.
Resigned and returned to station in China.

Instructor ALEJANDRO DE MESA
Appointed pensionado to the United States.

(*c*) Transfers.

Assistant Instructor CONSTANTINO RABAYA
Transferred to the Division of Sawmills and Utilization.

Due to the fact that the Degree Course is now being taught in the School of Forestry, additional faculty members are required. At least two members of professorial rank should be appointed by the University. One assistant in engineering is badly needed and a ranger if available may be appointed for this position.

Upon the return of Forest Supervisor Carlos Sulit the staff will be materially strengthened.

One professor on leave in the United States returned in May.

INSTRUCTION

(*a*) RANGER COURSE

The instruction in the Ranger Course has been considerably simplified during the past two years. It is a very important question as to what should be taught in this course. Two full years of instruction are given and experience has demonstrated that more is required of the ranger in the field than can be given him in this time. The best material possible should be secured from the high schools. The school attempts to give the student some general subjects in addition to the forestry work required to fit him for his position.

The field work in Forest Engineering II was held on the Calamba Estate Addition. This was in charge of Professor Luis R. Salvosa assisted by Instructor Felipe Salvoza and Assistants Seguerra and Sulit.

The first semester began on June 9, and the second on November 3.

(*b*) DEGREE COURSE

The first class in the Degree Course is now in its second year and has been given intensive instruction. It is the policy of the faculty to give these men as much forestry work as possible in order to strengthen them in their profession. At present four students are taking the regular course and six partial work.

The four regular students spent the dry season on land-classification work and therefore no instruction was given in Forest Engineering V.

The regular semester in the Degree Course started one month late awaiting the return of these four students who were out on land-classification work for the Bureau.

COMMENCEMENT

The twelfth annual commencement was held on March 16 in the Malaruhat Grove. Twenty-five seniors were graduated, of whom the following were the honor men:

Medalist	Mariano Galenzoga.
First-honor man	Gabriel Pascual.
Second-honor man	Calixto Santos.
Honorable mention for excellent work in the Port Lebak Reconnaissance	Castor Jundak.

The first-honor man Gabriel Pascual was a Borneo pensionado.

The commencement address was delivered by Secretary Apostol of the Department of Agriculture and Natural Resources.

Other speakers were:

Presentation of medal	President Palma of the University.
Presentation of diplomas	Dean Arthur F. Fischer, Director of Forestry.
For the Alumni	Forester Antonio P. Racelis.
For the Class of 1924	Mariano Galenzoga.

Class Day Exercise were held on March 15. The morning was devoted to athletics, consisting of races, volley ball, tug of war, basket ball, etc.

The program of the class was held in the afternoon in the Molave Grove. Speeches were delivered by the class representative and faculty members followed by the planting of the Class tree "Camagon" (Diospyros discolor).

The bonfire with attendant festivities was the feature of the evening.

ALUMNI

The organization of an alumni association has been proposed and this will be of great benefit to the graduates and school.

It is essential that the address and vocation of every alumnus be secured and kept on file. An association through correspondence and the Makiling Echo can do considerable in securing this information. While most of the graduates are at present employed in the Bureau of Forestry there are several whose address and vocation are unknown.

The following table which was published in last year's report has been brought up to date:

Alumni arranged by classes, provinces, and countries from which registered in the School of Forestry as of December 31, 1924

Province	Classes													Total
	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	
Abra								1	1		1	1		4
Albay		1	2	2								[a]1		6
Bataan		1	1										2	4
Batangas	1			1		3				1				6
Benguet (Mountain Province)												2		2
Bohol		1		1				1						3
Bulacan	1	2		2	2			1		1	1			10
Cagayan		1	2		2	2		1	3	1		2		14
Camarines Norte									1					1
Camarines Sur		3	1			2		3	1	1				11
Capiz				1	1	1	1	3						7
Cavite		1	1	1	1									4
Cebu	1		1			1	1				2			6
Ilocos Norte	1	1	1			2	2	1		1		4	3	16
Ilocos Sur	1	1	2	1		1	1	1		3		1		12
Iloilo	1	2		3		2	1			1	2	1	1	14
Isabela			1		2			1	1		1	1		7
Laguna		1	2	1					1		2	1	2	10
La Union		1	1		1				1		[a]1	1	2	8
Leyte	1								1		3	1	1	7
Marinduque		1												1
Manila		1	1				1							3
Mindoro		1	1											2
Misamis		1	1									1	1	4
Nueva Ecija	1		1		2			2				[a]1	[a]1	8
Nueva Vizcaya						2							1	3
Occidental Negros		1			1		2						2	6
Oriental Negros	2						3							5
Palawan		1												1
Pampanga	2	1	1	1		1			1				1	8
Pangasinan		2	2	3	3	1	4	3	5	4	4	2	3	36
Rizal		1		1	2	1	1	1		1				8
Romblon			1											1
Samar		1									1		1	3
Sorsogon	1		1								[a]2			4
Surigao											1			1
Tarlac	1		4		1	1			1		1	[a]2	2	13
Tayabas	3		1			1	1			1			1	8
Zambales		2	1	1	1		1		1		3	2		12
Zamboanga			1										1	2
China			1	1	3		1	1	3					10
Guam					2									2
Total	17	29	32	20	24	21	20	20	21	15	25	24	25	293

[a] British North Borneo pensionado.

IMPROVEMENT

The following improvements were made at the school during the year:

(*a*) Construction of a sanitary toilet and bath for the students. This consists of a concrete building with galvanized-iron roof and contains 6 showers and 6 toilets. The addition of this improvement was of great benefit to the school especially in sanitation. The work was done by the engineering force of the College of Agriculture. Four thousand five hundred pesos was appropriated by the University for this improvement.

(*b*) A sawali ceiling was added to the Mess Hall making it much cooler than formerly. This was necessary as the building is hot especially during the dry season.

(*c*) A new road from the School of Forestry road towards the swimming pool was constructed and eventually will be continued across the Molawin creek. This costs practically nothing as the work was done by student labor on Saturdays. It is surfaced as far as the charcoal kilns and graded some distance further.

(*d*) The solution in the batteries of the Delco Light Plant was filtered and new acid added. This work was done by the Department of Chemistry, of the College of Agriculture.

(*e*) Ornamental planting has been continued on the Campus as in past years.

(*f*) Two of the nursery sheds were reroofed as they were leaking badly.

(*g*) The student garden has been continued but no new area was added. Rotation of crops is practiced and the same area is being used continually.

(*h*) The trail from the Swimming Pool to the Molawin Horse trail has been under construction for three years and the work was continued during the month of December by the class in forest engineering. It is now practically completed and can be used in the near future. The banks of the Molawin Creek along this trail will be used for Arboretum purposes. A cliff at one place in the trail caused the delay in construction.

All the trails in the old nursery which has been transformed into an Arboretum have been brushed out and repaired.

(*i*) The School of Forestry road is badly in need of resurfacing, but has been temporarily repaired by our labor force.

(*j*) The library has been moved from the corner room to the one formerly used for silviculture, thus giving it more room

as it was badly crowded. The office force was transferred to the former library, thus giving more space for personnel.

SPECIAL FEATURES

The senior class (Class of 1925) together with five members of the faculty spent three days in the town of Paete, Laguna, during the month of October. This trip was made for the purpose of investigating the wood-using industries located there and to visit the forest which contains several species which are not found on Mount Makiling.

Some of the students engaged in athletic competition in connection with the Los Baños Unit of the University.

A weekly convocation is a new feature at the school this year and consists of songs, instrumental music, and speeches by various faculty members from the other colleges here as well as outsiders.

A sawdust club composed of students in the Degree Course was organized. The Forestry Club still continues its activities.

Many visitors of note were here at various times throughout the year. In addition various schools from Manila and other towns came on excursions especially on Sundays and holidays, chief of which were the following:

Association Institute of Manila.
The Ateneo de Manila.
Cavite High School.
Biological Class of St. Brigida College, Batangas.
Philippine Normal School.
Manila North High School.
Manila East High School.
University of Manila.

Lectures and talks were given by different individuals among whom were Brigadier-General Frank McCoy and Colonel Langhorne of the Governor-General's Staff, President Palma and Captain McBride of the University, Director Fischer and Forester Luis J. Reyes, Wood Technologist of the Bureau, gave lectures at various times.

The school coöperated with the Colleges of Agriculture and Veterinary Science by making an exhibit during the Laguna Provincial Fair.

The school personnel attended the Loyalty Day exercises at the College of Agriculture, the student company winning second place in the military competition.

One day was spent by the students under faculty supervision in the locust campaign in coöperation with the College of Agriculture.

The school library was increased by the addition of several thousand books and pamphlets which were loaned by Professor Pflueger. These were sent from the United States, the University paying the freight charges.

The management of the school mess has been taken over by the faculty, thus eliminating considerable friction. It is under the direction of Professor Salvosa and under his capable management the cost has been reduced and the quality of the meals improved.

CRUDE RUBBER INVESTIGATION

The undersigned has been delegated by the Governor-General to gather all available information regarding rubber production in the Philippines. This work was intended primarily for cooperation with the Committee appointed by the United States Rubber Commission, which spent several months investigating the possibilities of rubber plantation in this country. Two foresters of this Bureau were detailed to the investigation, and as a result of the various studies made, it has been conclusively demonstrated that rubber can be, and is being, grown commercially in the Philippine Islands.

The factors which are oftentimes advanced as being against the possibilities of rubber planting in the Philippines, such as lack of suitable labor, prevalence of storms or typhoons, and unsuitable climatic conditions, have proved to be more of a propaganda by certain interests inimical to the extension of rubber planting in the Philippines rather than to have an actual basis in fact. Various studies were made of the rubber estates in Mindanao and elsewhere, and in every case, the conditions on these estates were found to be equal to, if not better than, the existing conditions on the best Federated Malay States and Sumatra plantations. This is supported by the fact that while the economic depression in 1922 and 1923 was financially fatal to many plantations in the Federated Malay States and Sumatra, the Philippine plantations during this period were able to hold their own, producing and selling rubber at a profit in the same markets with the Middle East plantations. This was in spite of the lack of skilled labor and the comparatively untrained supervising force then employed.

The soil expert of the United States Rubber Commission has given out information in the press that the Philippine

soil and climatic conditions were found equal to the best among the rubber producing countries visited by the Commission. It was concluded therefore that the climate and rainfall in Mindanao, where studies were made of extensive lands suitable for rubber plantation, were satisfactory. Likewise, it was found that the labor question was greatly exaggerated, and that there is sufficient labor available in the Philippines. The principal drawback noted by the investigators are the laws governing the tenure of the land, the change of which this Bureau has repeatedly advocated by means of new legislation, which would make the concession of land more acceptable to investors and at the same time beneficial to the interest of the Government through the reforestation of the vast cogon areas with rubber trees, thus creating a new source of wealth and revenue out of what are now nonproductive lands and a market in which the local inhabitants could sell their labor.

DIVISION OF SAWMILLS AND UTILIZATION

PERSONNEL

The personnel of the division was increased by the addition of eight newly graduated rangers from the School of Forestry, which was partly counteracted by resignations and transfers of three rangers and one forester. The number of guard positions remains the same but the efficiency of this force is continuously maintained at a comparatively low level by resignations of the best men and frequent turnover of the force through the comparatively low salaries provided as compared with work outside the Bureau and the consequently poorer type of men attracted and the loss of the better men to lumber companies as soon as they become experienced.

In the face of this meager increase in the personnel of the division, the demand of increased work due to increasing activities of old mills, establishment and opening of new mills, and increasing demands for inspection of lumber for exports is creating a serious situation as to the proper and efficient handling of the work. During the year, the volume of logs scaled and lumber inspected and the corresponding revenue therefrom show an increase of 80 per cent over the volume and revenue for the year 1923. Mills whose operations were formerly insufficient to warrant the cost of maintaining a scaler have increased their output, while new mills have started operations with no men available to attend to the Government's interest in the scaling and manifesting of the logs so that if the Govern-

ment expects to get the revenue due it from the public forests as well as to maintain the forests in a permanent revenue-producing condition, it is imperative that additional positions be provided for and that the efficient men already in the service be given salaries more on a par with similar work outside the Bureau.

SCALING

During the past year, with the development of the special studies made by Forester Wendover, considerable advance has been made in methods of instruction and checking and a larger percentage of the 1924 class of rangers was given instruction in scaling work than for some years past. Experience with these men and checking of some of the old men in the field, however, only emphasizes the necessity of having every ranger graduated from the School of Forestry given training in scaling work and a more thorough grounding in the principles of scaling.

Although the personnel of this Bureau is insufficient to measure and invoice every piece of timber cut and removed from the public forest, as should be done, every forest officer should have a thorough training in and understanding of scaling work so that what work we are able to do in measuring timber is done correctly and fairly to the licensee and the Government. The inability of the Bureau to give a fair scale due to lack of personnel and lack of sufficient training in scaling because of other pressing work will be a serious handicap in the future.

The purchaser of logs from a licensee is principally interested in avoiding payment for defects and waste material from which he can get no return and while present systems of measurement followed by many log buyers are more than unfair to the licensee, the buyers will find some means of reducing their payments, law or no law, unless the Government scale gives a fair measurement of the sound timber in the log instead of the total cubical contents, sound and unsound, which is too generally the case to-day in invoices prepared by forest officers outside of sawmill operations.

During the year 1924, the cost of log scaling in the different districts was from 1.7 centavos per cubic meter in District No. 13 to 8.9 centavos per cubic meter in District No. 1, with an average of 4.6 centavos for all districts and 6.1 centavos for the district and Manila Office expenses for supervision and training of new scalers.

The total cost of operation for the division was 7.7 centavos per cubic meter of timber scaled and lumber and ties inspected,

as compared with a total cost of 12.1 centavos for the year 1923, and the net revenue amounted to ₱554,245.91 or an average of ₱46,187.16 per month for this year, as compared with a total net revenue, ₱317,277.81 or an average of ₱26,439.81 per month for the year 1923. Detailed figures of cost and revenue are shown in the tables on pages 62 and 63.

GRADING

The requests for inspection of lumber for grade remain about the same as during previous years as the larger companies engaged regularly in the export trade maintain their own corps of graders, while the local trade has not progressed to the point of demanding a uniform system of grades. The increasing volume of shipments to Australia and the demand of the Australian Government for a Bureau of Forestry certificate of freedom from wood-boring insects have, however, considerably increased the volume of inspection work being done by lumber inspectors, so that a total of 6,105,708 board feet of lumber and 90,077 railroad ties had been inspected during the year 1924, as compared with a total of 3,058,000 board feet of lumber and 48,774 ties for the year 1923. The total revenue from these inspections, including travel expenses of inspectors, was ₱14,317.22 for the year 1924, as compared with ₱2,690.02 for the year 1923, while the cost of inspection was ₱1,931.66, no cost data for 1923 kept separate from total division costs.

BUREAU OF FORESTRY

Division of Sawmills and Utilization

[Cost and revenue statement for January-December, 1924]

COST

District	Scaling			Grading			Wood collections			Holidays and leave			Totals		
	Days	Total cost	Cubic meter cost	Days	Total cost	Cubic meter cost	Days	Total cost	Cubic meter cost	Days	Total cost	Cubic meter cost	Days	Total cost	Cubic meter cost
1	134	₱302.16	₱0.089	.....	.....	.....	13	₱16.48	.....	.....	.....	.....	147	₱318.64	₱0.094
2	.....	.....	.....	.....	.....	.....	¾	2.50	.....	.....	.....	.....	¾	2.50	.....
3	333½	621.41	.072	.....	.....	.....	½	.67	.....	46¼	₱55.77	.....	380¼	677.85	.078
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	1,022½	2,103.44	.037	6¼	₱12.80	₱0.382	4	12.28	.....	288¼	703.52	.....	1,321	2,832.04	.050
6	950½	2,215.96	.062	½	1.77	.006	8¾	20.97	.....	135	269.25	.....	1,094¾	2,507.95	.070
7	3,284¾	8,103.09	.028	113½	413.39	.040	22½	62.13	.....	762¾	1,828.85	.....	4,183½	10,407.46	.034
8	2,845¼	6,795.95	.073	317½	1,350.05	.345	68¼	177.58	.....	799	2,109.04	.....	4,029¾	10,432.62	.107
9	10¼	32.97	.083	.....	.....	.....	5	12.29	.....	.....	.....	.....	15¼	45.26	.114
10	451½	1,095.75	.071	17½	60.67	1.079	¾	2.23	.....	79¾	156.86	.....	549½	1,315.51	.085
11	1,377¾	2,685.83	.032	7¼	10.84	.006	15½	40.22	.....	407¾	897.03	.....	1,808¼	3,633.92	.042
12	6½	23.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6½	23.25	.....
13	639½	1,135.62	.017	5	38.61	.019	¾	1.53	.....	138½	257.99	.....	783¾	1,433.75	.020
Total	11,056	25,115.43	.038	467¼	1,888.13	.102	139¾	348.88	.....	2,657¼	6,278.31	.....	14,320¼	33,630.75	.050
Supervision and instruction	2,447½	14,507.71	.022	89¼	287.25	.015	359½	1,093.98	.....	643¾	3,576.60	.....	3,540	19,465.54	.028
Grand total	13,503½	39,623.14	.061	556½	2,175.38	.107	499¼	1,442.86	.....	3,301	9,854.91	.....	17,860¼	53,096.29	.077

District	Scaling		Grading		Total scaling and grading		Revenue	Net revenue
	Log scale	Forest charges	Volume	Fees				
	Cubic meter		*Cubic meter*		*Cubic meter*		*Cubic meter*	
1	3,371.78	₱4,831.20	19.69	₱68.58	3,391.47	₱4,899.78	1.444	₱4,581.14
2								
3	8,601.93	6,686.85			8,601.93	6,686.85	.777	6,009.01
4								
5	56,311.90	63,492.80	33.32	15.71	56,345.22	63,508.51	1.127	60,676.47
6	35,426.09	30,678.80	353.06	1,026.86	35,779.15	31,705.66	.858	29,197.71
7	389,741.20	218,556.47	10,317.65	6,516.37	300,058.85	225,072.84	.750	214,665.38
8	92,887.05	120,958.98	3,908.38	2,717.59	96,795.43	123,676.57	1.308	113,243.95
9	396.69	788.94			396.69	788.94	1.988	743.68
10	15,396.59	15,113.36	56.19	120.36	15,452.78	15,233.72	.986	13,918.21
11	83,563.88	79,782.65	1,711.84	642.58	85,275.72	80,425.23	.943	76,791.31
12								
13	66,866.50	54,066.59	2,006.01	1,277.51	68,872.51	55,344.10	.803	53,910.35
Total	652,563.61	594,956.64	18,406.14	12,385.56	670,969.75	607,342.20	.905	573,711.45
Supervision and instruction								19,465.54
Grand total	652,563.61	594,956.64	18,406.14	12,385.56	670,969.75	607,342.20	.905	554,245.91

The large increase in export during 1923 as a result of the attention paid to foreign markets by the larger lumber companies, together with the numerous inquiries from the United States and other countries for Philippine lumber has produced a marked increase in activities of the various sawmills, while the local consumption of mill-sawn lumber has also increased creating an active market and an increasing interest in the establishment of new sawmills.

The relative increase in activity of the sawmill industry is shown in the following table of available figures of log scale, production sales, and export:

Year	Number of mills	Log scale	Forest charges	Mill tally	Mill sales	Export	Total cut from public forest
		Cu. m.	*Pesos*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*
1916	8	178,985.25	142,501.78	46,758,699	.....	17,024,024	94,101,000
1917	10	202,474.42	157,385.47	58,205,351	.....	12,186,184	101,115,000
1918	16	241,302.28	182,022.60	70,960,712	65,752,110	7,080,376	105,296,000
1919	19	288,340.06	245,524.11	86,165,806	82,025,106	6,813,256	136,485,000
1920	21	314,538.17	270,692.01	94,828,897	94,262,607	18,862,256	150,957,000
1921	28	369,826.73	336,624.80	99,594,339	86,434,571	11,790,168	180,227,000
1922	28	372,842.39	349,767.77	111,120,864	114,860,911	18,285,000	173,615,000
1923	32	483,803.22	416,259.41	136,318,870	136,676,619	36,949,904	182,006,000
1924	37	652,104.63	566,448.62	168,399,997	155,911,782	50,746,864	260,535,600

During the year the old Punta Flecha Sawmill, which was closed in 1923, was taken over by local Filipino capital and started sawing in July, 1924, with plans for relocating and enlarging the mill.

The old Tonquil Timber Co. mill was taken over by Mr. P. J. Moore and is being relocated and repaired for renewed operation on the Islands of Bulaan, Sulu.

The two new mills being installed on the Island of Catanduanes are now ready for operation according to reports received, while the old mill at Denrika, Camarines Sur, has started operations under the license agreement recently granted to the Cadwallader-Gibson Lumber Co.

The operation of the old sawmill at Santa Cruz, Laguna, has been taken over by a reorganized company which is planning a better logging operation that should place it among the larger and more active mills.

Except for the Punta Flecha Mill for which the scaler formerly stationed there was available all these mills, together with the two in Mindoro and four or five in Samar, Leyte, and

Dinagat, whose activities are increasing, are practically without Government scalers to properly measure and manifest the timber cut by them from the public forest as a result of the limitation set in the appropriations for employment of new men and the loss of old men due to low salaries provided.

MARKETS

During the year, the local markets have absorbed a total of 141,357,289 board feet of lumber and timber including 4,670,884 board feet of imported wood, as compared with a total volume of 147,127,000 board feet including 2,071,000 board feet of imports purchased during the whole of 1923. The approximate distribution of sales in the various parts of the Islands during 1923 and 1924 is shown in the following table of shipment reported from the different mills.

Lumber shipments, January to December, inclusive

	1924	1923
Manila	52,355,747	54,025,398
Luzon ports	17,382,297	16,633,842
Cebu	5,501,370	3,889,237
Iloilo	4,262,292	2,057,121
Visayan ports	25,426,490	18,377,036
Zamboanga	3,320,866	1,803,821
Davao	259,283	231,961
Mindanao and Sulu ports	4,255,816	3,247,874
Unclassified ports	16,759,536	6,945,126
Total	129,623,697	107,211,416

The reduction of volume of shipments recorded for Manila is largely due to more detailed reports of export shipments which were formerly reported as shipped to Manila, owing to the fact that they were transshipped at that point. The above figures demonstrate the increased activity in building operations in the provinces especially among the sugar centrals of Negros and the hemp-producing regions of Samar and Leyte where the largest increase of sales are recorded under Visayan ports.

FOREIGN MARKETS

During the present year, exports of lumber and timber have increased 13,797,000 board feet over those for the same period of 1923, so that the total exports amounted to 50,747,000 board feet as compared with 37,000,000 board feet during 1923.

The following table shows the comparative amounts of exports to different countries from January to December, inclusive, for 1923 and 1924:

Exports of timber and lumber from January to December, inclusive

	1924		1923	
	Volume	Value	Volume	Value
United States	23,036,768	₱2,192,009.00	19,684,622	₱1,719,086.00
Guam			27,986	3,010.00
United Kingdom	5,001,080	410,589.00	2,600,816	210,621.00
Canada	89,888	10,406.00	29,256	3,410.00
Australia	4,041,568	280,632.00	2,864,120	239,309.00
British East Indies			97,000	8,610.00
Hongkong	184,016	9,687.00	726,312	60,429.00
China	6,276,472	543,188.00	6,279,440	497,941.00
Japan	12,053,896	608,665.00	4,569,024	309,401.00
France		95	71,000	5,800.00
Hawaii	7,208	700		
Spain	8,480	371.00		290.00
Italy	848	127.00		
Belgium	46,640	3,950.00		
Total	50,746,864	4,060,419.00	36,949,576	3,057,907.00

The largest increase to be noted in the above table is in shipments to Japan. As noted in last year's report, the increasing interest in Philippine lumber among the Japanese and the greater attention paid to this market by local lumbermen had resulted in a heavy increase in exports during 1923 previous to the great earthquake over those of the same period for 1922. The active market for lumber created by that disaster created a boom in Philippine lumber which lasted until about March of the present year when unfavorable exchange and import duties caused a temporary collapse from which excellent signs of recovery are to be noted during August and September. However, during the last three months of the year the market became active again, and in November, the import amounted to over 7,000,000 board feet.

Japan forms a natural market for much of the surplus output of Philippine lumber, and this Bureau has coöperated with the Philippine Lumbermen's Association in further developing this market by sending one of its foresters to Japan, his expenses being paid by the Association to study the requirements of the special wood-using industries of Japan and the suitability of various Philippine species for their requirements and to bring to the attention of Japanese lumber dealers and government authorities the present discrepancies in classification of Philippine lumber for import duties as compared with woods

from other countries which at present acts as a hindrance to development of the trade through the higher rates collected.

The slight drop in the shipments to China and Hongkong due to the unsettled conditions and civil war there during the past year has been more than made up by the increases to other countries, and as soon as conditions become settled again, the volume of exports should rapidly increase to a point on a par with or greater than those to the United States as large quantities of the lower grades of lumber can be shipped to and sold in that market.

Considering distance and competition of African and South American woods, the steadily-increasing shipments to the United Kingdom is especially interesting as an indication of the interest being shown in that market in Philippine lumber as compared with the already established species from other countries and the fact that this will develop into an established market for the better grades at least of local lumber.

Lumber and timber exported from the Philippine Islands

Species	1924 (January to December)			1923 (January to December)			1922 (January to December)		
	Cubic meter	Board feet	Value	Cubic meter	Board feet	Value	Cubic meter	Board feet	Value
To the United States:									
Narra timber				2	848	₱150			
Miscellaneous timber	15	6,360	₱638						
Narra lumber	1	424	225	2	848	528	(?)		₱80
Tangile lumber	9,216	3,907,584	491,543	6,447	2,733,528	274,548	4,340	1,840,160	220,450
Almon lumber	2,409	1,021,416	110,641	1,661	704,264	61,970	643	272,632	27,226
Lauan lumber	37,239	15,789,336	1,352,254	31,149	13,207,176	1,120,218	12,039	5,104,536	450,105
Guijo lumber				1,593	675,432	80,713	304	128,896	14,650
Apitong lumber	3,166	1,342,384	105,543	5,011	2,124,664	155,353	1,701	721,224	56,532
Miscellaneous lumber	2,286	969,264	131,165	561	237,864	25,606	213	90,312	9,134
Total	54,332	23,036,768	2,192,009	46,424	19,684,624	1,719,086	19,240	8,157,760	778,177
To Hongkong:									
Guijo timber				11	4,664	213			
Apitong timber				71	30,104	1,351			
Miscellaneous timber				328	139,072	6,308	23	9,752	2,443
Narra lumber				1	424	65	1	424	163
Tangile lumber	1	424	95						
Almon lumber							287	121,688	10,000
Lauan lumber	270	114,480	1,143				218	92,432	7,939
Guijo lumber							150	63,600	10,621
Apitong lumber	77	32,648	3,079	1,237	524,488	39,596	2,548	1,080,352	71,892
Miscellaneous lumber	86	36,464	5,370	65	27,560	12,896	452	191,648	33,850
Total	434	184,016	9,687	1,713	726,312	60,429	3,679	1,559,896	136,908
To China:									
Narra timber							(?)		18
Guijo timber							29	12,296	2,699
Tangile timber							9	3,816	550
Miscellaneous timber	14	5,936	664	2	848	150	7	2,968	697
Narra lumber	11	4,664	1,536	32	13,568	3,967	22	9,328	2,104
Tangile lumber	841	356,584	34,288	329	139,496	11,042	52	22,048	1,982
Almon lumber	1,008	427,392	35,271	25	10,600	727	164	69,536	4,081
Lauan lumber	11,743	4,979,032	435,678	13,144	5,573,056	441,972	9,788	4,150,112	285,896
Guijo lumber				22	9,328	1,523	156	66,144	11,094
Apitong lumber	1,110	470,640	29,043	913	387,112	23,364	1,334	565,616	40,905
Miscellaneous lumber	76	32,224	6,708	343	145,432	15,196	38	16,112	2,486
Total	14,803	6,276,472	543,188	14,810	6,279,440	497,941	11,599	4,917,976	352,512

To British Africa:									
Lauan timber							21	8,904	677
Miscellaneous timber							12	5,088	588
Total							33	13,992	1,265
To Singapore:									
Lauan lumber							13	5,512	450
To Netherlands:									
Tangile lumber									
Lauan lumber									
Total									
To Guam:									
Tangile lumber									
Apitong lumber				59	25,016	2,250	219	92,856	9,792
Lauan lumber				7	2,968	760			
Miscellaneous lumber							22	9,328	2,500
Total				66	27,984	3,010	241	102,184	12,292
To Hawaii:									
Lauan lumber	17	7,208	700						
To Spain:									
Narra timber							4	1,696	335
Apitong timber							2	848	92
Miscellaneous timber							11	4,664	944
Narra lumber			21			110	1	424	71
Tangile lumber						50	6	2,544	292
Lauan lumber	19	8,056	281						
Miscellaneous lumber	1	424	69			130	8	3,392	563
Total	20	8,480	371			290	32	13,568	2,297
To Germany:									
Narra lumber							1	424	205
Miscellaneous lumber							(?)		25
Total							1	424	230
To France:									
Tangile lumber				31	13,144	1,600			
Apitong lumber				137	58,088	4,200			
Miscellaneous lumber			95						
Total			95	168	71,232	5,800			

Lumber and timber exported from the Philippine Islands—Continued

Species	1924 (January to December)			1923 (January to December)			1922 (January to December)		
	Cubic meter	Board feet	Value	Cubic meter	Board feet	Value	Cubic meter	Board feet	Value
To Japan:									
Narra timber							3	1,272	₱171
Molave timber	2	848	₱170						
Tangile timber	40	16,960	766				3	1,272	113
Lauan timber	313	132,712	10,613						
Miscellaneous timber	15,408	6,532,992	148,894	1,325	561,800	₱42,762	25	10,600	1,001
Narra lumber	21	8,904	2,637	32	13,568	3,025	33	13,992	2,992
Tangile lumber	207	87,768	8,920	164	69,536	7,293	137	58,088	4,859
Almon lumber				9	3,816	425	107	45,368	2,183
Lauan lumber	9,817	4,162,408	375,392	6,953	3,948,072	201,367	243	103,032	7,259
Guijo lumber				9	3,816	640	2	848	146
Apitong lumber	1,827	774,648	27,815	1,312	556,288	14,632	3	1,272	174
Miscellaneous lumber	794	336,656	33,458	972	412,128	39,257	111	47,064	10,022
Total	28,429	12,053,896	608,665	10,776	4,569,024	309,401	667	282,808	28,920
To Australia:									
Miscellaneous timber				29	12,296	600			
Tangile lumber	545	231,080	16,496	53	22,472	1,003	628	266,272	24,437
Almon lumber	3,605	1,528,520	117,459	1,912	810,688	73,316	2,677	1,135,048	141,259
Lauan lumber	4,763	2,019,512	134,051	4,761	2,018,664	164,390	2,677	1,135,048	111,365
Apitong lumber	55	23,320	1,153				2	848	101
Miscellaneous lumber	564	239,136	11,473				390	165,360	20,699
Total	9,532	4,041,568	280,632	6,755	2,864,120	239,309	6,374	2,702,576	297,861
To United Kingdom:									
Narra lumber									
Tangile lumber	427	181,048	19,732	75	31,800	3,920	337	142,888	16,741
Lauan lumber	3,858	1,635,792	128,125	4,097	1,737,128	141,997	333	141,192	21,682
Apitong lumber	7,471	3,167,704	260,514	1,808	766,592	59,117	159	67,416	5,275
Miscellaneous lumber	39	16,536	2,218	154	65,296	5,587	156	66,144	5,622
Total	11,795	5,001,080	410,589	6,134	2,600,816	210,621	985	417,640	49,320
To Canada:									
Tangile lumber	34	14,416	2,863						
Almon lumber									
Lauan lumber	130	55,120	5,514						
Apitong lumber	48	20,352	2,029	12	5,088	380			
Miscellaneous lumber				57	24,168	3,030			
Total	212	89,888	10,406	69	29,256	3,410			

To British East Indies:									
Miscellaneous timber									
Tangile lumber				229	97,096	8,610			
Apitong lumber							225	95,400	6,636
Lauan lumber							36	15,264	1,072
Miscellaneous lumber									
Total				229	97,096	8,610	261	110,664	7,708
To Italy:									
Miscellaneous timber	1	424	50						
Lauan lumber	1	424	69						
Apitong lumber			2						
Miscellaneous lumber			6						
Total	2	848	127						
To Belgium:									
Tangile lumber	13	5,512	650						
Lauan lumber	13	5,512	450						
Apitong lumber	84	35,616	2,850						
Total	110	46,640	3,950						
To All Countries:									
Molave timber	2	848	170						
Narra timber				2	848	150	7	2,968	524
Tangile timber	40	16,960	766				12	5,088	663
Guijo timber				11	4,664	213	29	12,296	2,699
Apitong timber				71	30,104	1,351	2	848	92
Lauan timber	313	132,712	10,613				21	8,904	677
Miscellaneous timber	15,438	6,545,712	150,246	1,684	714,016	49,820	78	33,072	5,673
Total timber	15,793	6,696,232	161,795	1,768	749,632	51,534	149	63,176	10,328
Narra lumber	33	13,992	4,119	67	28,408	7,695	58	24,592	5,615
Tangile lumber	11,284	4,784,416	574,587	7,328	3,107,072	308,066	5,500	2,332,000	268,761
Almon lumber	7,022	2,977,328	263,371	3,607	1,529,368	136,438	3,878	1,644,272	184,749
Lauan lumber	67,870	28,776,880	2,533,657	60,111	25,488,064	2,070,704	25,347	10,747,128	885,768
Guijo lumber				1,624	688,576	82,876	612	259,488	36,511
Apitong lumber	13,838	5,867,312	432,028	10,489	4,447,336	298,892	6,191	2,624,984	191,307
Miscellaneous lumber	3,846	1,630,704	190,562	2,152	912,448	101,702	1,390	589,360	84,901
Total lumber	103,893	44,050,632	3,998,324	85,378	36,201,272	3,006,373	42,976	18,221,824	1,657,612
Grand total	119,686	50,746,864	4,160,119	87,146	36,949,904	3,057,907	43,125	18,285,000	1,667,940

Lumber and timber imported into the Philippine Islands

Species	1924 January to December			1923 January to December			1922 January to December		
	Cubic meters	Board feet	Value	Cubic meters	Board feet	Value	Cubic meters	Board feet	Value
From the United States:									
Ties									
Cedar timber	3	1,272	₱76	507	214,968	₱10,632			
Miscellaneous timber	138	58,512	13,146	4	1,696	812	5	2,120	₱40
Pine lumber	4,218	1,788,432	162,090	3,463	1,468,312	104,820	2,943	1,247,832	79,690
Redwood lumber	155	65,720	10,741	197	83,528	16,541	44	18,656	3,377
Cedar lumber				491	208,184	16,838	168	71,232	6,539
Cedar box shooks			141,143			118,991	(?)	(?)	8,371
Staves			71,542			77,758			
Oak lumber							24	10,176	2,348
Miscellaneous lumber	3,064	1,299,136	82,864	6	2,544	479	9	3,816	79
Total	7,578	3,213,072	481,602	4,668	1,979,232	346,871	3,193	1,353,832	100,444
From Canada:									
Cedar timber	738	312,912	9,824						
Miscellaneous timber									
Pine lumber							224	94,976	4,738
Cedar lumber									
Miscellaneous lumber									
Total	738	312,912	9,824				224	94,976	4,738
From Hongkong:									
Miscellaneous timber									
Cedar lumber									
From China:									
Miscellaneous timber	1	424	4	4	1,696	147			272
Cedar box shooks						3,102			
Staves			170			41			
Miscellaneous lumber	30	12,720	1,214	28	11,872	3,725	35	14,840	827
Total	31	13,144	1,388	32	13,568	7,015	35	14,840	1,099
From Siam:									
Miscellaneous lumber	47	19,928	4,958						

From Japan:									
Miscellaneous timber									
Staves						60			
Miscellaneous lumber	19	8,056	220						14
Total	19	8,056	220			60			14
From United Kingdom:									
Miscellaneous timber									
From Australia:									
Miscellaneous timber									
Miscellaneous lumber	2	848	10						
Total	2	848	10						
From British East Indies:									
Miscellaneous timber				50	21,200	2,793			
Staves			20						
Miscellaneous lumber	223	94,552	9,433	122	51,728	5,620	765	324,360	7,990
Total	223	94,552	9,453	172	72,928	8,413	765	324,360	7,990
From French East Indies:									
Miscellaneous timber	5	2,120	125						
Miscellaneous lumber	7	2,968	190	11	4,664	119	6	2,544	326
Total	12	5,088	315	11	4,664	119	6	2,544	326
From Spain:									
Miscellaneous lumber									
From Dutch East Indies:									
Miscellaneous timber							49	20,776	160
From Netherlands:									
Cedar box shooks									
From Germany:									
Staves						527			
From Guam:									
Miscellaneous lumber									
From Argentina:									
Miscellaneous timber	8	3,392	636						
Lignum Vitae							48	20,352	2,092
Miscellaneous lumber	53	22,472	864						
Total	61	25,864	1,500				48	20,352	2,092

Lumber and timber imported into the Philippine Islands—Continued

Species	1924 (January to December)			1923 (January to December)			1922 (January to December)		
	Cubic meter	Board feet	Value	Cubic meter	Board feet	Value	Cubic meter	Board feet	Value
From Siberia:									
Miscellaneous lumber				1	424	14			
From All Countries:									
Ties									
Cedar timber	741	314,184	₱9,900	507	214,968	₱10,632			
Miscellaneous timber	152	64,448	13,911	58	24,592	3,752	54	22,896	₱472
Cedar lumber				491	208,184	16,838	168	71,232	6,539
Cedar box shooks			141,143			122,093	(?)	(?)	8,371
Pine lumber	4,218	1,788,432	162,090	3,463	1,468,312	104,820	3,167	1,342,808	84,428
Redwood lumber	155	65,720	10,741	197	83,528	16,541	44	18,656	3,377
Oak lumber							24	10,176	2,348
Staves			71,732			78,386			
Lignum Vitae lumber							48	20,352	2,092
Miscellaneous lumber	3,445	1,460,680	99,753	168	71,232	9,957	815	345,560	9,236
Total	8,711	3,693,464	509,270	4,884	2,070,816	363,019	4,320	1,831,680	116,863

THE UTILIZATION SECTION

This section continued the work of investigation on various properties and uses of timbers, and other forest products. The work of this section has been materially handicapped due to frequent shifting of its subordinate personnel during the year. Two rangers who are certified lumber inspectors spent most of their time inspecting and grading lumber and attending to other work connected with it. The wood technologist and one new ranger were left to do the regular work and these were occasionally called upon to do inspection of lumber which service was urgently needed. For this reason, investigation work of this Office has not materially progressed during the year. The present force is too small to do investigating as well as inspection work. A forester is expected to return the early part of the ensuing year for assignment to this section and it is hoped to increase the personnel by additional rangers to ameliorate this condition.

The most important work done by this section is in connection with the trip of the wood-technologist to Japan, which lasted three months. Upon the request of the lumbermen, the wood technologist has been ordered to proceed to Japan to investigate the market for Philippine lumber in said country and at the same time to investigate the wood-using industries which is one of the most highly developed in the world. He visited the large companies interested in Philippine hardwoods and he made them acquainted with the properties and uses of these woods which have been recently introduced in their country. Japanese lumbermen complained of the unusual shrinkage of Philippine woods, but a thorough investigation carried out by the Forest Experiment Station revealed the fact that Philippine woods do not warp and shrink any more than the common Japanese hardwoods, and that the whole trouble lies in the fact that our woods are used for furniture and construction before they are thoroughly seasoned. An authority on architecture, Prof. Takeda of the Kyoto Imperial University, reports that he found no unusual shrinkage in lauans which he has used.

The wood technologist also visited the various wood-using industries and ascertained the consumption of wood in them. Japan consumes a large amount of wood, the per capita consumption being placed at 772 board feet while the United States, in the same year, the per capita consumption amounted to about

400 board feet. A detailed report on the wood-using industries of Japan will be made by the wood technologist.

It is hoped that the visit of a representative of this Bureau to Japan will be of help in developing the trade with the neighboring Empire. Japan has a meagre supply of hardwoods and they are of small size. Thus, in converting into lumber there is an unusually high percentage of waste. A supply of hardwoods of good quality and big dimensions will have to be imported from abroad and in this connection the Japanese people are looking forward to the Philippine Islands and other regions of Indo-Malaya to supply them with these woods. It might be mentioned in passing that of all woods coming from Indo-Malaya, those of the Philippines enjoy the best reputation because our woods are better classified and are more carefully graded. As a result of this, practically all woods coming from Indo-Malaya are marketed in Japan under Philippine names such as lauan, tangile, apitong, etc.

During this trip, the wood technologist also helped the technical staff of the Bureau of Forestry and the Forest Experiment Station in the study of the properties and uses of the Philippine woods in connection with plan of including our commercial woods in the Japanese Tariff Laws. These entities have been requested to submit recommendations regarding the proper amount of duty to impose upon our woods, and it was during this time that the wood technologist arrived in Japan. At the present time Philippine woods are unclassified, and as such a duty of 15 per cent are imposed upon them, whereas Oregon pine, firs, and cedars enter Japan free of duty. Oak and mahogany, more valuable woods than lauans and apitongs, only have to pay a duty of 5 and 10 per cent advalorem, respectively.

This trip of the wood technologist to Japan will, it is hoped, help establish a permanent market for our woods in Japan where an immense amount of hardwoods are needed, not only for the reconstruction of Tokyo and Yokohama, but also in other cities where industries require large amounts of wood.

WOOD PRESERVATION

No new experiments had been carried out in wood preservation. This work could not be carried out because of the lack of properly trained men to do the work. The Atlantic Gulf and Pacific Company, with whom the Bureau has been coöperating, has completed the installation of the commercial treating plant,

and is now in position to treat large amount of lumber and timber for construction. This company treated during the year about 128,470 pieces of railroad ties aggregating 2,500,000 board feet, and timber amounting to about 840,000 board feet. They have also treated 570 poles and 769 piles. Practically all of the woods treated are apitong and these are used as substitute for our durable but scarce woods such as ipil, molave and yakal which are the woods commonly used in places requiring durability and strength. Treated apitong timber is now used in greater amounts in construction when formerly it could not be used due to lack of durability. The experiments in preservative treatment of ties by different processes, were placed in the different Bank sugar centrals in Negros and records of their locations made. Examinations of these ties will be made periodically and the condition of each individual tie will be recorded. More experiments in wood preservation should be made. So far only apitong is known to treat satisfactorily. It may be possible that by modifying certain processes, other common woods can be similarly treated.

STUDY OF WOOD STRUCTURE

Studies in wood structure were carried on some 40 or 50 species of woods. This work will be finished this coming year, and the data will be used in the revision of Bulletin No. 14 entitled: "Commercial Woods of the Philippines: Their Preparation and Uses," written by the former wood expert of this Bureau, Mr. E. E. Schneider, in 1916. A few microscopic mounts have been prepared but due to shifting of personnel, the work had to be suspended. The preparation of the microscopic mounts will be made this coming year as more time will be devoted to the study of the anatomical features of woods.

BENDING WOODS

No new experiment in bending wood was carried on account of the lack of suitable apparatus for this purpose. This work should be investigated for the interest of the wood-using industries, but it can not be done unless there are avaliable funds and personnel to do the work. The Philippine Islands imports yearly thousands of pesos worth of bent wood furniture, and factory industry similar to those of Vienna and Japan could be started here in order to supply part, if not all of the demand, for bent wood furniture. With the crude methods now employed

in the bent wood factories, only rattan can be bent satisfactorily and they cannot bend hardwoods. Another industry that uses bent wood is the vehicle industry. Rims of carromatas and carretons and automobiles are generally made from bent wood and a promising industry can be started if more modern methods of bending are employed.

TESTING TIMBER

Timber testing has been continued intermittently during the year when the engineers in the Bureau of Science are not engaged in other work pertaining to that Bureau. Due to the large number of tests made on woods of each species, the work is considerably prolonged, and on top of this the lack of proper sawing apparatus for the preparation of test specimens has contributed to the slow progress of the work. The man in charge of the work states that the actual test will be completed in May and June 1925 and that the data will be compiled this coming year if two engineers are detailed to do the work.

IDENTIFICATION

The usual work of identification of Samples submitted to this Office was carried out during the year. No record is being kept of the number of samples submitted to this Office, but it may be estimated that the number identified by the different members of the Section runs into thousands. The work is an important function of this section due to the fact that different species of timber which are very little known in the trade, now reach the market. This year about 34 wood specimens from China were submitted to this Office for identification, and a number were received from Australia and Japan.

INSPECTION AND GRADING

This Section inspected during the year, 2,007,635 board feet, of which 463,967 board feet were lumber for export, 1,292,497 board feet were railroad ties and 251,173 board feet were piles. Nearly 31 per cent of all timber inspected by this Bureau was inspected by this section.

STUDIES IN SPECIAL WOOD-USING INDUSTRIES

The experiments carried out by this Bureau in connection with golf shafts and Polo mallet heads as well as fishing rods show that there are suitable woods found in the Islands which can be used as substitutes for imported material. Lumbayau-batu has been used for polo clubs and is said to be fairly satisfactory.

Palomaria is a promising wood for polo clubs. This wood possesses similar physical characteristics as hard maple, and has the advantage of being tough and cross-grained. Palomaria is easy to obtain, and if found satisfactory, a large amount of wood which now goes to waste, can be utilized. Palomaria is suitable wood for the manufacture of hubs of carromatas, caretelas, and caretons, and is much used for this purpose due to its cross-grained properties combined with great toughness making it very hard to split. The other woods tested for polo mallet heads were duñgon, sampalok, malugai, guijo, and bansalagin. These woods did not prove suitable on account of their excessive weight.

This Office has turned out about a dozen golf shafts and distributed them to golf enthusiasts of the city for trial. The following woods were tried: malugai, guijo, aranga, yakal, palma-brava and piagau. All of these woods, except palma-brava, proved unsatisfactory. Other woods which are worth trying for golf shafts are spliced bamboos, and the various species of palms which are found in abundance throughout the Philippines. At the present time palma-brava (*Livistona rotundifolia*) is suitable for this purpose. There are other various species of palms which are similar to palma-brava, but whether these are equally suitable remains to be seen. Fishing poles of palma-brava are said to be excellent by men who are expert, and several thousand strips of palma-brava have been sent abroad to be manufactured into fishing rods. It is almost certain that as this material is better known in America and Europe, a large demand will be created for manufacture into sporting goods.

EXTENSION SERVICE

The extension service as carried out by this section consists of giving free information of the properties and uses of Philippine woods, and minor forest products. As has been mentioned before, hundreds of people come to this Office with samples for determination. Close to 1,000 students of the city schools came to this Office during the year for information on forestry and forest products in connection with their studies in biology and other kindred subjects. The teachers made previous arrangements for the visit, and once they are in the Working Collection, they are given short talks on forestry and forest products. This Office welcomes similar visitors as by coming to the Bureau they gain first-hand information on forestry and forest products.

WORKING COLLECTION

There were received during the year, 536 wood specimens, 75 of which were accompanied with botanical material, 297 were trade samples, and 164 were received from foreign countries. Five planks not previously represented in the Working Collection were received. A total of 286 botanical specimens were received during the year. These were forwarded to the Bureau of Science for identification and mounting. Due to the lack of men in the Bureau of Science qualified to identify samples, botanical materials have been held pending for considerable time in that Bureau, and wood specimens accompanying them had to be held, pending receipt of the identification of the botanical material. Due to the fact that no reconnaissance work was done during the year, no extensive collections were made, and what has been collected represents only the collections by various men when making field trips connected with other work. There is much work yet to be done in botanical collection as less than half of the species that grow to merchantable sizes are represented in the Working Collection of the Bureau. The total number of merchantable species according to Mr. Merrill is nearly 3,000 as shown by the Enumeration of the Flowering Plants of the Philippines recently published by the Bureau of Science, but the number of species now available in the Working Collection of the Bureau is much less than half of this number. The Bureau of Forestry needs the services of a dendrologist to do systematic collection, and it is believed that this will be cheaper and the result more satisfactory than for the forest officers to do the collection of botanical and wood specimens.

SALE AND DISTRIBUTION OF SPECIMENS

There were sold during the year, 1,206 hand-specimens, and 6,889 were distributed gratis. Of this there were 3,248 distributed to private parties principally to educational and commercial entities, 2,860 to the School of Forestry, and 181 to the various forest stations of this Bureau.

CARPENTRY SHOP

The small carpentry shop which this Office maintains turned out all the specimens for distribution, polished the planks and other specimens of the Working Collection, and does minor repair work to furniture and fixture in the central office. Besides the work of polishing the planks, the shop turned out six filing cases and index cards, 50 scaling sticks for the use of scalers

of the Bureau, 4 typewriting tables, 2 office desks (for forester), and made numerous small odds and ends for the central office. On carpenter has been retained in the Bureau of Science in order to help prepare the material for testing.

DIVISION OF FOREST LANDS AND MAPS

IN GENERAL

The calendar year 1924 was a banner year for this division. The previous records have been broken as can be noted in the summaries of the work accomplished by the different sections. All efforts were concentrated on land classifications as was done in the previous year, but nevertheless, it is gratifying to note the relative increase in the results accomplished in other lines of work. However, there still remained a considerable amount of pending work at the end of the year caused by the insufficiency of personnel and funds available to push through the various activities of this division.

No radical change in previous policies were made, but various memoranda were issued during the year outlining certain improvements in the existing procedure, particularly in land classification.

PERSONNEL

The field and office force of this division at the end of the year consisted of the following: 1 forester, 1 forest supervisor, 1 forest surveyor, 44 rangers, 1 forest guard, 13 drafstmen, 1 junior stenographer, 4 clerks, and 1 messenger.

LAND CLASSIFICATION

In accordance with the policy laid down by the Department Secretary in connection with the classification of public lands, this division has been guided during the year in executing classification work, first, by localities or regions where a large number of land settlers are actually found; second, by the places to which the tide of immigration of homesteaders is flowing; and third, by those which, because of their peculiarly favorable conditions, are liable to be preferred by land settlers.

Every effort was exerted to cope with the numerous requests for land classification from municipal, provincial, and insular entities. All available field and office forces were mobilized to carry on the work. Although it is gratifying to note that there was a marked increase in the area covered by the land classification during the year as compared with any of the previous

years, this Office desires to emphasize that, if not for the uncertainty and inadequacy of the funds allotted to this division, a greater amount of work could have been accomplished and consequently reduced the considerable amount of accumulated pending work both in the field and office at the end of the year. As an instance, the field parties working in remote regions have been, of necessity, recalled to the Manila Office in September in order to avoid any possible overdraft in traveling expenses. The work was, however, resumed on the last days of November to the end of the year, additional allotment having been allowed by the Emergency Board. It may not be amiss to state in this connection that the uncertainty and inadequacy of the appropriation has caused hardships on this division in planning the distribution of men to do the land classification and, furthermore, the Government, as a consequence, incurred unnecessary expenses for the transportation of the parties recalled to Manila for lack of appropriation, which, after all, have to return to the same work in view of the additional allotment granted. In the interest of economy and efficiency of the work, this matter will be taken into consideration in the ensuing appropriations.

It should also be stated herein that in view of the inability of this Office to attend to many requests for land classification, some provinces have offered their coöperation by furnishing the necessary funds to carry out the work. Such is the case with the Subprovince of Catanduanes which voted the sum of ₱800 which was made available for the expenses of the land-classification party. The Province of Antique also voted ₱500 for this purpose, but it was disapproved by the Executive Bureau.

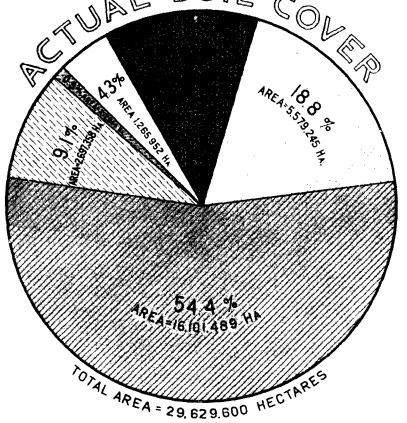
The old procedure of numbering the projects throughout the Philippine Islands was changed and a new procedure adopted. At present, each province is given a series of project numbers beginning from project No. 1 by municipalities and upwards until all the municipalities are provided for.

This Office certified during the year 286 projects with a total area of 1,485,353.11 hectares as compared with 206 projects with a total area of 1,375,944.32 hectares in the previous year. It should be noted that of these projects, 232 with an area of 165,882.32 hectares are ordinary and cadastral cases which were certified without performing any further field work as compared with 155 projects containing a total area of 538,622.68 hectares in the previous year.

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

BUREAU OF FORESTRY

LAND CLASSIFICATION

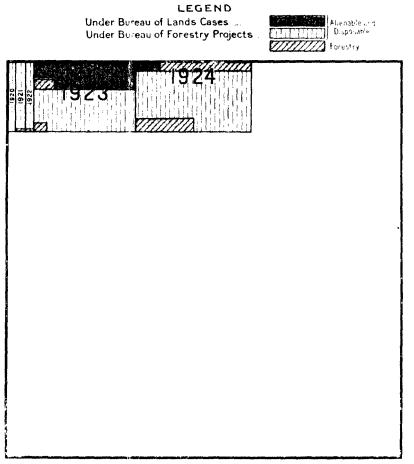


PROGRESS OF LAND CLASSIFICATION WORK

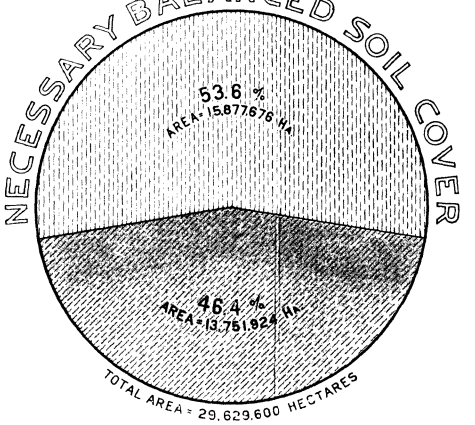
LEGEND

Under Bureau of Lands Cases — Alienable and Disposable

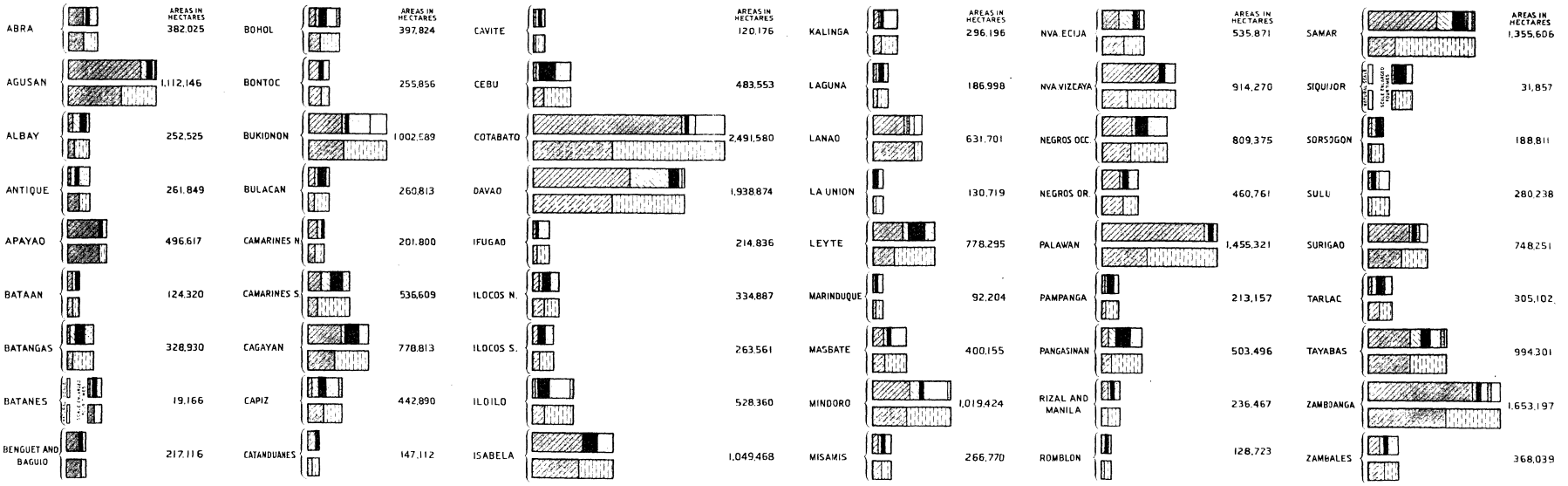
Under Bureau of Forestry Projects — Forestry



TOTAL AREA=29,629,600 HECTARES



RELATION BETWEEN THE ACTUAL SOIL COVER AND THE NECESSARY BALANCE BY PROVINCES



The pending projects in the central office up to the end of the year as shown in Table II below are due mainly to insufficient personnel, rangers as well as drafstmen, who could attend to the compilation of the data submitted by the field parties.

The following three tables will show the land-classification projects certified during the current year, those pending at the close of the year, and those certified since the enactment of the Public Land Law on November 29, 1919:

TIMBER LANDS

The extensive areas covered by the land classification projects certified to the Bureau of Lands during this year has enabled this Office to accomplish a notable increase in the number of timber land blocks as compared with the year 1923. Among the land classification projects classified and certified to the Bureau of Lands this year, there were established in 59 projects timber land blocks containing an aggregate area of 280,645.19 hectares, or about four times the area established and certified in the previous year. The respective areas of these timber land blocks are included in the tabular statement on land classification. In addition to the timber land blocks certified, there were also established during this year 246 blocks of timber lands in connection with 69 land classification projects pending certification to the Bureau of Lands on December 31, 1924, the areas of which could not be given. The following table shows the timber lands established in connection with the land classification and the corresponding areas certified by fiscal years:

Statement of land classification projects certified during the year 1924

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable and disposable	Timber land	Total		
3-A	Proclamation No. 4	S. 1923	Albay	Albay			9-26-24	1,020.7270		1,020.7270	(a)	Albay Cadastre, B. L. Case No. 1.
3-B	Do	do	do	do			do	1,224.6171		1,224.6171	(a)	Albay Cadastre, B. L. Case No. 2.
3-D	Do	do	do	do			do	1,364.6104		1,364.6104	(a)	Albay Cadastre, B. L. Case No. 4.
3-E	Do	do	do	do			do	1,250.6456		1,250.6456	(a)	Albay Cadastre, B. L. Case No. 5.
3-F	Do	do	do	do			do	2,128.4080		2,128.4080	(a)	Albay Cadastre, B. L. Case No. 6.
3-G	Do	do	do	do			do	2,864.1336		2,864.1336	(a)	Albay Cadastre, B. L. Case No. 7.
3-H	Do	do	do	do			do	1,377.4872		1,377.4872	(a)	Albay Cadastre, B. L. Case No. 8.
3-I	Do	do	do	do			do	1,833.7370		1,833.7370	(a)	Albay Cadastre, B. L. Case No. 9.
3-J	Do	do	do	do			do	3,035.0508		3,035.0508	(a)	Albay Cadastre, B. L. Case No. 10.
3-K	Do	do	do	do			11-15-24	5,896.0428	1,136.0036	7,032.0459	(a)	Albay Cadastre, B. L. Case No. 11.
5-A	Proclamation No. 4	S. 1923	Albay	Camalig			9-26-24	1,009.1391		1,009.1391	(a)	Camalig Cadastre, B. L. Case No. 1.
5-B	Do	do	do	do			10-29-24	2,335.6837	583.8750	2,919.5587	(a)	Camalig Cadastre, B. L. Case No. 2.
5-C	Do	do	do	do			10-26-24	1,210.2637		1,210.2637	(a)	Camalig Cadastre, B. L. Case No. 3.
5-D	Do	do	do	do			9-29-24	1,809.8844		1,809.8844	(a)	Camalig Cadastre, B. L. Case No. 4
5-E	Do	do	do	do			do	3,612.0509		3,612.0509	(a)	Camalig Cadastre, B. L. Case No. 5.
5-F	Do	do	do	do			9-30-24	2,866.6951		2,866.6951	(a)	Camalig Cadastre, B. L. Case No. 6.
1	Do	S. 1920	Bataan	Samal			9-27-24	521.0886		521.0886	(a)	Samal Cadastre, B. L. Case No. 1.
3	Do	do	do	do			7-30-24		1,428.9215	1,428.9215	(a)	Samal Cadastre, B. L. Case No. 3.
10	Do	S. 1923	do	Abucay			9-24-24	687.9434		687.9434	(a)	Abucay Cadastre, B. L. Case No. 1.

11	Do	do	do	do			do	1,314.1370		1,314.1370	[a]	Abucay Cadastre, B. L. Case No. 2.
12	Do	do	do	do			7-12-24	3,193.9700	2,968.9300	6,162.9600	[a]	Abucay Cadastre, B. L. Case No. 3.
13	Director of Forestry	6-18-24	do	Orani	6-22-24	6-24-24	8-19-24	3,860.0000	2,619.5630	6,479.5630	₱10.50	Orani Cadastre, B. L. Case No. 145.
14	Do	do	do	Hermosa	6-21-24	6-30-24	11- 6-24	5,951.6896	1,549.6104	7,501.3000	58.35	
15	Do	do	do	Dinalupihan	6-25-24	7- 3-24	do	5,606.0000		5,606.0000	89.55	
6-A	Proclamation No. 4	S. 1923	do	Balanga	11- 2-24	11- 7-24	12-31-24	864.0000		864.0000	52.40	Amending Project No. 6.
12-A	Do	do	do	Abucay	11- 7-24	do	do	172.0000		172.0000	[b]	Amending Project No. 12.
16	Director of Forestry	6-18-24	Bataan	Orion	6-27-24	7- 1-24	10-24-24	3,349.9860		3,349.9860	₱41.70	
17	Do	do	do	Limay	6-24-24	6-26-24	do	1,841.1465		1,841.1465	32.15	
1-B	Proclamation No. 4	S. 1920	Batangas	Balayan			10-17-24	3,154.5815	142.2900	3,296.8715	[a]	Balayan Cadastre, B. L. Case No. 4.
3	Do	S. 1923	do	Tanauan			9-18-24	103.8250		103.8250	[a]	Tanauan Cadastre, B. L. Case No. 1.
4	Do	do	do	do			7-25-24	931.8607		931.8607	[a]	Tanauan Cadastre, B. L. Case No. 2.
5	Do	do	do	do			do	1,084.2223		1,084.2223	[a]	Tanauan Cadastre, B. L. Case No. 3.
6	Do	do	do	do			do	980.4699		980.4699	[a]	Tanauan Cadastre, B. L. Case No. 4.
7	Do	do	do	do			7-24-24	1,492.1396		1,492.1396	[a]	Tanauan Cadastre, B. L. Case No. 5.
8	Do	do	do	do			7-29-24	12,410.7800		12,410.7800	[a]	Tanauan Cadastre, B. L. Case No. 6.
9	Do	do	do	do			do	14,557.5310		14,557.5310	[a]	Tanauan Cadastre, B. L. Case No. 7.
10	Do	do	do	do			7-30-24	1,245.1340		1,245.1340	[a]	Tanauan Cadastre, B. L. Case No. 8.
3-A	Do	do	do	do			10-14-24	1,830.1458	48.1855	1,878.3313	[a]	Tanauan Cadastre, B. L. Case No. 9.
12	Do	do	do	do			9-24-24	846.0618		846.0618	[a]	Tanauan Cadastre, B. L. Case No. 10.
1	Director of Forestry	1-23-24	Bulacan	San Miguel de Mayumo.	1-24-24	2-12-24	9-26-24	22,160.1360	83.6000	22,243.7360	₱191.55	
6	Proclamation No. 4	S. 1923	do	Malolos			9-24-24	1,061.1154		1,061.1154	[a]	Malolos Cadastre, B. L. Case No. 5.
7	Do	do	do	do			do	624.1296		624.1296	[a]	Malolos Cadastre, B. L. Case No. 6.

[a] No expenses covering field work are given, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Expenses are included in Bataan Project No. 6-A.

Statement of land classification projects certified during the year 1924—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable and disposable	Timber land	Total		
6-A	Proclamation No. 4	S. 1923	Bulacan	Malolos			10 23-24	46.3359		46.3359	(a)	Malolos Cadastre, B. L. Case No. 1.
9	Do	do	do	do			9-24-24	246.6432		246.6432	(a)	Malolos Cadastre, B. L. Case No. 8.
6-E	Do	do	do	do			10-24-24	1,767.6748	89.6162	1,857.2910	(a)	Malolos Cadastre, B. L. Case No. 7.
6-D	Do	do	do	do			12- 6-24	1,540.7711		1,540.7711	(a)	Malolos Cadastre, B. L. Case No. 4.
6-C	Do	do	do	do			11-19-24	1,571.4382		1,571.4382	(a)	Malolos Cadastre, B. L. Case No. 3.
6-B	Do	do	do	do			do	206.8543		206.8543	(a)	Malolos Cadastre, B. L. Case No. 2.
2-A& 2-B	Proclamation No. 65	S. 1920	Cagayan	Gonzaga	11-20-23	11-24-23	9-30-24	499.0250		499.0250	(a)	Amending Project No. 13.
3-A	Proclamation No. 4	S. 1923	do	Tuguegarao			10-21-24	353.0407		353.0407	(a)	Tuguegarao Cadastre B. L. Case No. 1.
3-B	Do	do	do	do			do	956.9954		956.9954	(a)	Tuguegarao Cadastre, B. L. Case No. 2.
3-C	Do	do	do	do			do	764.8446		764.8446	(a)	Tuguegarao Cadastre, B. L. Case No. 3.
3-D	Do	do	do	do			do	1,040.4549		1,040.4549	(a)	Tuguegarao Cadastre, B. L. Case No. 4.
3-E	Do	do	do	do			do	501.6758		501.6758	(a)	Tuguegarao Cadastre, B. L. Case No. 5.
2-C	Proclamation No. 65	S. 1920	do	Gonzaga			12-31-24	460.0000		460.0000	(a)	Amending Project No. 13.
3-G	Proclamation No. 4	S. 1923	Cagayan	Tuguegarao			10-28-24	1,091.0243		1,091.0243	(a)	Tuguegarao Cadastre, B. L. Case No. 7.
12	Proclamation No. 65	S. 1920	do	Calayan	6-30-23	7-13-23	8- 5-24	2,981.2000	12,836.4000	15,817.6000	(a)	All Calayan Island.
2	Director of Forestry	1-24-24	Camarines Norte.	Mambulao	2-13-24	3-14-24	11- 6-24	2,165.7227	63.4500	2,229.1727	₱369.25	
3	Do	do	do	Paracale	3-18-24	5- 1-24	11-15-24	7,440.0000	390.3000	7,830.3000	567.81	
4	Do	do	do	Indan	5- 8-24	5-16-24	12-31-24	6,575.1750	1,352.9500	7,928.1250	86.90	
5	Do	do	do	Labo	5-19-24	6- 5-24	do	12,675.5000	1,184.6250	13,861.1250	360.72	
6	Do	do	do	S. Vicente	6-16-24	6-21-24	do	4,293.0000		4,293.0000	78.90	
7	Do	do	do	Daet	6-26-24	6-12-24	do	12,713.7250	736.0900	13,449.8150	171.60	
8	Do	do	do	Basud	7-18-24	7-25-24	do	5,751.0000	3,133.6900	8,884.6900	171.60	
10	Do	do	do	Talisay			do	1,545.0750		1,545.0750	(a)	

1-A	Proclamation No. 4	S. 1923	Capiz	Capiz			11-13-24	1,010.5099	1,391.1410	2,401.6509	[a]	Capiz Cadastre, B. L. Case No. 1.
1-C	Do	do	do	do			9-26-24	3,170.8762		3,170.8762	[a]	Capiz, Cadastre, B. L. Case No. 3.
2-A	Do	do	do	do			do	2,869.0686		2,869.0686	[a]	Dao Cadastre, B. L. Case No. 1.
2-B	Do	do	do	do			9-24-24	1,447.7298		1,447.7298	[a]	Dao Cadastre, B. L. Case No. 2.
2-C	Do	do	do	do			9-26-24	4,538.3004		4,538.3004	[a]	Dao Cadastre, B. L. Case No. 3.
2-D	Do	do	do	do			10-27-24	4,185.2233	6,159.5447	10,344.7680	[a]	Dao Cadastre, B. L. Case No. 4.
3-A	Do	do	do	Sigma			9-24-24	6,468.2770		6,468.2770	[a]	Sigma Cadastre, B. L. Case No. 1.
3-B	Do	do	do	do			11- 1-24	3,610.9130	252.0000	3,862.9130	[a]	Sigma Cadastre, B. L. Case No. 2.
4-A	Do	do	do	Panay			11-29-24	1,070.0000	3,855.9742	4,925.9742	[a]	Panay Cadastre, B. L. Case No. 1.
4-B	Do	do	do	do			9-26-24	1,837.4634		1,837.4634	[a]	Panay Cadastre, B. L. Case No. 2.
5	Do	do	Cebu	Cebu			6-21-24	87.1900	19.7500	106.9400	[a]	Cebu, Cadastre, B. L. Case No. 2.
6-A	Do	do	do	Bogo	11-13-23	7-28-24	10-11-24	1,247.5547	1.3973	1,248.9520	[a]	Bogo Cadastre, B. L. Case No. 1.
6-B	Do	do	do	do			do	4,391.1602		4,391.1602	[a]	Bogo Cadastre, B. L. Case No. 2.
6-C	Do	do	do	do			10-16-24	3,869.2262	2.6689	3,871.8951	[a]	Bogo Cadastre, B. L. Case No. 3.
7-C	Do	do	do	Carcar			10- 1-24	1,962.5174		1,962.5174	[a]	Carcar Cadastre, B. L. Case No. 5.
11	Proclamation No. 67	S. 1920	Cotabato	Balatican	2-18-24	3-20-24	9-23-24	5,280.0000		5,280.0000	₱249.37	
13	Do	do	do	Kitubud	do	do	do	1,328.0000		1,328.0000	157.68	
14	Do	do	do	Carmen	2-19-24	4-30-24	do	11,236.0000		11,236.0000	648.69	
15	Do	do	do	Kabakan	2-20-24	4-20-24	do	8,352.0000		8,352.0000	165.32	
16	Do	do	do	Reina Regente.	7-18-24	7-31-24	11-22-24			[a]	[a]	Dulawan Cadastre, B. L. Case No. 3.
16-A	Do	do	do	do	do	do	12- 6-24			(c)	[a]	Dulawan Cadastre, B. L. Case No. 4.
17	Do	do	do	Talayan	5-27-24	do	do			(c)	[a]	Do.
24	Do	do	do	Maganoy						[b]	[a]	Do.
31-A	Do	do	do	Kiamba			10-17-24	1,865.5497		1,865.5497	[a]	Tuguis Extension, B. L. Cadastre No. 152.
9	Do	do	do	Parang	5- 2-23	9-16-23	12-31-24	12,391.9490		12,391.9490	₱123.83	
10	Do	do	do	Buldon	6- 7-23	do	do	5,667.8458		5,667.8458	[a]	

[a] No expenses covering field work are given, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Area is included in Cotabato Project No. 32–C, certified on November 22, 1924.

[c] Area is included in Cotabato Project No. 32–D, certified on December 6, 1924.

Statement of land classification projects certified during the year 1924—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable and disposable	Timber land	Total		
32-A	Proclamation No. 4	S. 1923	Cotabato	Dulawan, Libungan, Gambar and Tumbao	10-29-22	11-19-22	8-27-24	12,040.2697		12,040.2697	(a)	Dulawan Cadastre, B. L. Case No. 1.
32-B	Do	do	do	Dulawan			do	12,428.7187		12,428.7187	(a)	Dulawan Cadastre, B. L. Case No. 2.
32-C	Do	do	do	do	5-23-24	7-28-24	11-22-24	7,017.3151	974.5625	7,991.8776	(a)	Dulawan Cadastre, B. L. Case No. 3.
32-D	Do	do	do	do	do	do	12- 6-24	11,509.4849	419.8593	11,929.3442	(a)	Dulawan Cadastre, B. L. Case No. 4.
33	Do	do	do	Lebak and Salaman.	9-6 -22	9-27-22	8-29-24	13,036.6800		13,036.6800	(a)	
34	Do	do	do	Liguasan			11-22-24			(b)	(a)	Dulawan Cadastre, B. L. Case No. 3.
37	Do	do	do	Kiamba			10- 6-24	2,611.8870		2,611.8870	(a)	Kanipa-an Extension Cadastre, B. L. Cadastre 153.
37-A	Do	do	do	Tuguis			10-17-24	30.3057		30.3057	(a)	Lots Nos. 115 and 123 Tuguis Cadastre, B. L. Cadastre No. 152.
5	Proclamation No. 67	S. 1920	Davao	Santa Cruz	5- 7-23	6-19-23	9-18-24	45,470.0000	400.0000	45,870.0000	P71.50	
	Do	do	do	Malita	6-20-23	8- 3-23	9-23-24	13,074.0000	637.2000	13,711.6000	254.00	
1-A	Proclamation No. 4	S. 1923	Ilocos Norte	Dingras			11-19-24	160.9305		160.9305	(a)	Dingras Irrigation Survey, B. L. Case No. 5.
1-B	Do	do	do	do			do	156.2881		156.2881	(a)	Dingras Irrigation Survey, B. L. Case No. 6.
7-A	Do	do	Ilocos Sur	Candon			9-26-24	162.4108		162.4108	(a)	Candon Cadastre, B. L. Case No. 1.
7-B	Do	do	do	do			do	629.7733		629.7733	(a)	Candon Cadastre, B. L. Case No. 2.
7-B	Do	do	do	do			do	693.6713		693.6713	(a)	Candon Cadastre, B. L. Case No. 4.
7-G	Do	do	do	do			do	540.0882		540.0882	(a)	Candon Cadastre, B. L. Case No. 7.
7-H	Do	do	do	do			do	471.1845		471.1845	(a)	Candon Cadastre, B. L. Case No. 8.

13-A	Do	do	do	Magsingal			do	421.1745		421.1745	[a]	Magsingal Cadastre, B. L. Case No. 1.
13-B	Do	do	do	do			do	1,255.0179		1,255.0179	[a]	Magsingal Cadastre, B. L. Case No. 2.
13-C	Do	do	do	do			do	384.2576		384.2576	[a]	Magsingal Cadastre, B. L. Case No. 3.
13-D	Do	do	do	do			do	549.9235		549.9235	[a]	Magsingal Cadastre, B. L. Case No. 4.
22-A	Do	do	do	Santa Lucia			do	385.1982		385.1982	[a]	Santa Lucia Cadastre, B. L. Case No. 1.
22-B	Do	do	do	do			do	323.9341		323.9341	[a]	Santa Lucia Cadastre, B. L. Case No. 2.
22-C	Do	do	do	do			do	531.2725		531.2725	[a]	Santa Lucia Cadastre, B. L. Case No. 3.
22-H	Do	do	do	do			do	439.0457		439.0457	[a]	Santa Lucia Cadastre, B. L. Case No. 8.
2	Do	do	Iloilo	Calinog			9-24-24	2,931.9275		2,931.8275	[a]	Calinog Cadastre, B. L. Case No. 1.
29-A	Do	do	do	do			10-13-24		18,237.1584	18,237.1584	[a]	Calinog Cadastre, B. L. Case No. 3.
33-A	Do	do	do	Passi			9-24-24	1,621.0343		1,621.0343	[a]	Passi Cadastre, B. L. Case No. 1.
33-B	Proclamation No. 4	S. 1923	Iloilo	Passi			9-24-24	6,822.8059	152.2060	6,975.0119		Passi Cadastre, B. L. Case No. 2.
33-C	Do	do	do	do			11- 8-24	15,477.3859	8,632.0238	24,109.4097		Passi Cadastre, B. L. Case No. 3.
33-D	Do	do	do	do			11-15-24	2,656.0225	292.7354	2,948.7579		Passi Cadastre, B. L. Case No. 4.
	Do	do	do	Sta. Barbara			10-27-24	18.6288	498.6587	517.2875		Santa Barbara Cadastre, B. L. Case No. 7.
11	Proclamation No. 4	S. 1923	Isabela	San Pablo			10-28-24	963.4730		963.4730		San Pablo Cadastre, B. L. Case No. 1.
4	Proclamation No. 4	S. 1923	Laguna	Mabitac			2-15-24	321.8300		321.8300		Mabitac Cadastre, B. L. Cad. No. 190.
6-A	Do	do	do	Pagsanjan			9-26-24	480.2369		480.2369		Pagsanjan Cadastre, B. L. Case No. 1.
6-B	Do	do	do	do			do	629.4765		629.4765		Pagsanjan Cadastre, B. L. Case No. 2.
6-C	Do	do	do	do			do	536.9404		536.9404		Pagsanjan Cadastre, B. L. Case No. 3.
6-D	Do	do	do	do			do	673.2866		673.2866		Pagsanjan Cadastre, B. L. Case No. 4.
6-E	Do	do	do	do			do	435.9004		435.9004		Pagsanjan Cadastre, B. L. Case No. 5.
	Proclamation No. 57	S. 1920	Lanao	Bakulud	7-18-23	7-26-23	6-18-24	6,423.7900	776.2500	7,200.0400	₱131.39	Lanao Cadastre B. L. Cadastral No. 63.
3-A	Proclamation No. 4	S. 1923	La Union	Aringay			9-24-24	245.1366		245.1366		Aringay Cadastre, B. L. Case No. 1.

[a] No expenses covering field work are given, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Area is included in Cotabato Project No. 32-D, certified on December 6, 1924.

Statement of land classification projects certified during the year 1924—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable and disposable	Timber land	Total		
3-B	Proclamation No. 4	S. 1923	La Union	Aringay			9-24-24	345.3117		345.3117		Aringay Cadastre, B. L. Case No. 2.
3-C	Do	do	do	do			9-22-24	812.7563	232.1482	1,044.9045		Aringay Cadastre, B. L. Case No. 3.
3-G	Do	do	do	do			11-21-24	640.3257		640.3257		Aringay Cadastre, B. L. Case No. 7.
4-B	Proclamation No. 4	S, 1920	La Union	Santo Tomas			9-24-24	998.0473		998.0473	(a)	Santo Tomas Cadastre, B. L. Case. No. 2.
1	Do	do	Leyte	Tacloban			7-29-24	21.2339		21.2339	(a)	Tacloban Cadastre, G. L. R. O. Record No. 56.
3	Director of Forestry	10-18-23	Masbate	Masbate	10-26-23	10-20-24	12-22-24	7,002.5000	14,427.5000	21,430.0000	₱192.94	
	Do	10-17-23	do	Aroroy	2- 9-24	2-17-24	do	19,677.5000	208,467.5000	228,145.0000	74.99	
2	Do	10-18-23	do	Dimasalang	11- 9-23	11-30-23	12-31-24	16,926.5250	30,777.9750	47,704.5000	225.55	
4 A	Do	do	do	Milagros	10-26-23	3- 9-24	12-31-24	9,125.5750	1,150.2000	10,275.7750	73.60	
1	Proclamation No. 63	S. 1920	Mindoro	Naujan	3-10-23	3-31-23	3- 6-24	27,621.0000	3,478.0000	31,099.0000	199.80	
3	Do	do	do	Pola	3- 3-23	6-27-23	3-31-24	15,347.1800	6,617.6000	21,964.7800	192.23	
4	Do	do	do	Pinamalayan	4-28-23	5-15-23	3-25-24	20,728.8300	3,270.2500	23,999.0800	140.22	
6	Do	do	do	Bongabon	3- 3-23	6-27-23	3- 3-24	24,738.3200		24,738.3200	56.40	Between Agsalin and Tambong Rivers.
7	Do	do	do	do	do	do	3- 6-24	2,714.0000	170.0000	2,884.0000	32.50	
	Do	do	do	Bulalacao	do	do	do	6,424.0000	265.0000	6,689.0000	75.75	
9	Do	do	do	San Jose	do	do	10-17-24	17,950.5000	1,557.0000	19,507.5000	200.00	
12	Director of Lands	3-10-23	Occidental Negros.	La Carlota			4-22-24	13,341.7000	798.0000	14,139.7000	(a)	La Carlota Cadastre, G. L. R. O. Rec. No. 72.
13-A	Proclamation No. 4	S. 1923	Occidental Negros.	Victorias			12-11-24	108.0000		108.0000	(a)	Extending alienable area certified on December 17, 1923 under Project No. 13.
17-A	Director of Lands	6-19-20	do	Kabankalan	7-29-21	11-27-21	11-28-24			(b)	(a)	Kabankalan Cadastre, B. L. Case No. 1.
17-B	Do	do	do	do	do	do	do			(b)	(a)	Kabankalan Cadastre, B. L. Case No. 2.
21-C	Proclamation No. 4	S. 1923	do	Escalante			10-27-24		8,317.4945	8,317.4945	(a)	Escalante Cadastre, B. L. Case No. 3.
23	Do	do	do	Manapla			11-29-24	8,668.4623	1,087.6000	9,756.0623	(a)	Manapla Cadastre, B. L. Cadastral No. 108.

22-A	Do	do	do	Ilog			12- 6-24	969.1113	1,375.2242	2,344.3355	(a)	Ilog Cadastre, B. L. Case No. 1.
22-B	Do	do	do	do			12-12-24	2,626.0574	1,315.8450	3,941.9024	(a)	Ilog Cadastre, B. L. Case No. 2.
22-C	Do	do	do	do			12-20-24	1,411.5000	1,369.7324	2,781.2324	(a)	Ilog Cadastre, B. L. Case No. 3.
7-A	Do	do	do	San Carlos			11-28-24			(c)	(a)	San Carlos Cadastre, B. L. Case No. 1.
7-B	Do	do	do	do			do			(c)	(a)	San Carlos Cadastre, B. L. Case No. 2.
7-C	Do	do	do	do			do			(c)	(a)	San Carlos Cadastre B. L. Case No. 3.
21-A	Proclamation No. 4	S. 1923	Occidental Negros.	Escalante			12-31-24	6,478.5545	687.5831	7,166.1376	(a)	Escalante Cadastre, B. L. Case No. 1.
3	Do	do	Oriental Negros.	Tanjay			2-25-24	1,400.1600	575.3200	1,975.4800	(a)	Tanjay Cadastre, B. L. Case No. 1.
4	Do	do	do	do			3-11-24	2,150.1700	421.2800	2,571.4500	(a)	Tanjay Cadastre, B. L. Case No. 2.
5	Do	do	do	do			3-25-24	2,589.9000		2,589.9000	(a)	Tanjay Cadastre, B. L. Case No. 3.
6	Do	do	do	do			do	7,127.0500	508.0000	7,635.0500	(a)	Tanjay Cadastre, B. L. Case No. 4.
3-A	Do	do	do	do			10-24-24		33,534.0607	33,534.0607	(a)	Tanjay Cadastre, B. L. Case No. 5.
8	Do	do	do	Ayuquitan			8- 5-24	1,085.3300		1,085.3300	(a)	Ayuquitan Cadastre, B. L. Case No. 1.
9	Do	do	do	do			do	1,154.3600	11.5300	1,165.8900	(a)	Ayuquitan Cadastre, B. L. Case No. 2.
10	Do	do	do	do			7-16-24	4,066.8468	1.6673	4,068.5141	(a)	Ayuquitan Cadastre, B. L. Case No. 3.
11	Do	do	do	do			6-28-24	2,535.9900	2,537.0000	5,072.9900	(a)	Ayuquitan Cadastre, B. L. Case No. 4.
12	Do	do	do	Sibulan			9-24-24	781.9851		781.9851	(a)	Sibulan Cadastre, B. L. Case No. 1.
13	Do	do	do	do			8-19-24	525.5795		525.5795	(a)	Sibulan Cadastre, B. L. Case No. 2.
14	Do	do	do	do			8-14-24	1,594.2891		1,594.2891	(a)	Sibulan Cadastre, B. L. Case No. 3.
15	Do	do	do	do			7-14-24	1,872.2253	976.1651	2,848.3904	(a)	Sibulan Cadastre, B. L. Case No. 4.
16	Do	do	do	do			7-25-2	1,536.7017	43.8169	1,580.5186	(a)	Sibulan Cadastre, B. L. Case No. 5.
17	Proclamation No. 4	S. 1923	Oriental Negros.	Sibulan			8-14-24		8,128.0715	8,128.0715	(a)	Sibulan Cadastre, B. L. Case No. 6.

[a] No expenses covering field work are given, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Area is included in Occidental Negros Project No. 17, certified on December 14, 1922.

[c] Area is included in Occidental Negros Project No. 7, certified on July 11, 1924.

Statement of land classification projects certified during the year 1924—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable and disposable	Timber land	Total		
1-D	Proclamation No. 4	S. 1923	Oriental Negros	Dumaguete			9-30-24	427.9956		427.9956	(a)	Dumaguete Cadastre, B. L. Case No. 6.
1-A	Do	do	do	do			do	193.4823		193.4823	(a)	Dumaguete Cadastre, B. L. Case No. 1.
1-B	Do	do	do	do			do	515.8054		515.8054	(a)	Dumaguete Cadastre, B. L. Case No. 2.
5-A	Director of Lands	5-26-24	Nueva Vizcaya.	Campote			6- 4-24	757.8400		757.8400	(a)	Region under In-87.
12-A	Proclamation No. 4	S. 1923	do	Bagabag			9-17-24	779.8700		779.8700	(a)	Bagabag townsite, K-No. 27.
9	Do	do	Pampanga	Mexico			9-26-24	2,049.2103		2,049.2103	(a)	Mexico Cadastre, B. L. Case No. 1.
10	Do	do	do	do			do	6,865.2330		6,865.2330	(a)	Mexico Cadastre, B. L. Case No. 3.
11	Do	do	do	San Fernando			do	595.5527		595.5527	(a)	San Fernando Cadastre, B. L. Case No. 1.
12	Do	do	do	Bacolor			do	1,450.7557		1,450.7557	(a)	Bacolor Cadastre, B. L. Case No. 1.
13	Do	do	do	do			do	3,487.7266		3,487.7266	(a)	Bacolor Cadastre, B. L. Case No. 4.
14	Do	do	do	Angeles			do	6,217.3740		6,217.3740	(a)	Angeles Cadastre, No. 94. G. L. R. O. Rec. No. 124, Exp. Cad. No. 1.
15-A	Do	do	do	Apalit			12-13-24	1,808.2188	150.8000	1,959.0188	(a)	Apalit Cadastre, B. L. Case No. 1.
15-B	Do	do	do	do			12-20-24	118.3318	640.1920	1,458.5238	(a)	Apalit Cadastre, B. L. Case No. 2.
15-C	Do	do	do	do			12-13-24	1,296.5389	1,775.4360	3,071.9749	(a)	Apalit Cadastre, B. L. Case No. 3.
25-A	Do	do	do	San Simon			12- 6-24	130.7798		130.7798	(a)	San Simon Cadastre, B. L. Case No. 1.
1	Director of Forestry	12-2-22	Pangasinan	Umingan	12-8-22	12-13-22	5- 9-24	2,224.1000	2,318.2000	4,542.3000	(a)	East of Umingan Lupao Road.
2	Do	do	do	do	do	do	do	17,948.5000	1,953.4000	19,901.9000	(a)	West of Umingan, Lupao Road.
13-A	Proclamation No. 4	S. 1923	do	San Miguel			10- 1-24	1,216.8635		1,216.8635	(a)	San Miguel Cadastre, B. L. Case No. 4.

13-B	Do	do	do	do			do	802.1420		802.1420	[a]	San Miguel Cadastre, B. L. Case No. 5.
18-A	Do	do	do	Urdaneta			10-15-24	259.1454		259.1454	[a]	Urdaneta Cadastre, B. L. Case No. 1.
6	Director of Lands	8-21-24	Rizal	Marikina			9- 2-24			(b)	[a]	Marikina Watershed.
1	Proclamation No. 4	S. 1923	Sulu	Maimbung			9-30-24	4,093.6658		4,093.6658	[a]	Maimbug Cadastre, B. L. Case No. 58.
2-B	Do	do	do	Parang			do	9,501.0563		9,501.0563	[a]	Parang Cadastre, B. L. Case No. 2.
3	Do	do	do	Siasi and Lepak.			10- 1-24	10,263.6453		10,263.6453	[a]	Siasi and Lepak Cadastre, B. L. Cad. No. 131.
5	Director of Lands	11-12-24	do	Jolo			11-22-24	23.6410		23.6410	[a]	Military Reservation Augur Barracks.
14	Proclamation No. 67	S. 1920	do	Panamao			12- 4-24	6,992.1097		9,113.8603	[a]	Panamao Cadastre, B. L. Cad. No. 159.
16	Proclamation No. 4	S. 1923	Tarlac	Anao			9-29-24	2,437.7550		2,437.7550	[a]	Anao Cadastre, B. L. Cad. No. 138.
20-A	Do	do	do	Camiling			do	255.8266		255.8266	[a]	Camiling Cadastre, B. L. Case No. 1.
20-B	Do	do	do	do			do	922.3300		922.3300	[a]	Camiling Cadastre, B. L. Case No. 2.
20-C	Do	do	do	do			do	1,854.9955		1,854.9955	[a]	Camiling Cadastre, B. L. Case No. 3.
20-D	Do	do	do	do			12- 6-24	2,326.3928	488.7448	2,815.1376	[a]	Camiling Cadastre, B. L. Case No. 4.
20-E	Do	do	do	do			9-29-24	1,086.1634		1,086.1634	[a]	Camiling Cadastre, B. L. Case No. 5.
20-F	Do	do	do	do			9-27 24	1,601.4231		1,601.4231	[a]	Camiling Cadastre, B. L. Case No. 6.
20-G	Do	do	do	do			do	839.8345		839.8345	[a]	Camiling Cadastre, B. L. Case No. 7.
20-H	Do	do	do	do			9-29-24	1,108.0895		1,108.0895	[a]	Camiling Cadastre, B. L. Case No. 8.
20-I	Do	do	do	do			do	740.0956		740.0956	[a]	Camiling Cadastre, B. L. Case No. 9.
20-J	Do	do	do	do			do	724.4825		724.4825	[a]	Camiling Cadastre, B. L. Case No. 10.
20-K	Do	do	do	do			do	828.0010		828.0010	[a]	Camiling Cadastre, B. L. Case No. 11.
20-L	Do	do	do	do			9-27-24	1,897.1337		1,897.1337	[a]	Camiling Cadastre, B. L. Case No. 12.
21-A	Do	do	do	Gerona			do	2,783.8093		2,783.8093	[a]	Gerona Cadastre, B. L. Case No. 1.
21-B	Do	do	do	do			do	3,298.4667		3,298.4667	[a]	Gerona Cadastre, B. L. Case No. 2.

[a] No expenses covering field work are given, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] No area is given as the project is the Mariquina river bed.

Statement of land classification projects certified during the year 1924—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable and disposable	Timber land	Total		
21-C	Proclamation No. 4	S. 1923	Tarlac	Gerona			9-27-24	4,728.5698		4,728.5698	(a)	Gerona Cadastre, B. L. Case No. 3.
21-D	Do	do	do	do			do	2,036.3428		2,036.3428	(a)	Gerona Cadastre, B. L. Case No. 4.
22-A	Do	do	do	Paniqui			do	3,256.6548		3,256.6548	(a)	Paniqui Cadastre, B. L. Case No. 1.
22-B	Do	do	do	do			do	1,307.3825		1,307.3825	(a)	Paniqui Cadastre, B. L. Case No. 2.
22-C	Do	do	do	do			do	3,009.6114		3,009.6114	(a)	Paniqui Cadastre, B. L. Case No. 3.
22-D	Do	do	do	do			do	3,203.0378		3,203.0378	(a)	Paniqui Cadastre, B. L. Case No. 4.
23	Do	do	do	Ramos			do	2,507.5558		2,507.5558	(a)	Ramos Cadastre, B. L. Case No. 180.
1-A	Do	do	do	Victoria			9-29-24	658.3579		658.3579	(a)	Victoria Cadastre, B. L. Case No. 1.
1-B	Do	do	do	do			do	1,375.9808		1,375.9808	(a)	Victoria Cadastre, B. L. Case No. 3.
1-C	Do	do	do	do			do	2,959.4160		2,959.4160	(a)	Victoria Cadastre, B. L. Case No. 4.
1-D	Do	do	do	do			do	1,549.9459		1,549.9459	(a)	Victoria Cadastre, B. L. Case No. 5.
1-E	Do	do	do	do			do	1,246.6523		1,246.6523	(a)	Victoria Cadastre, B. L. Case No. 6.
1-F	Proclamation No. 4	S. 1923	Tarlac	Victoria			9-29-24	1,595.1353		1,595.1353	(a)	Victoria Cadastre, B. L. Case No. 2.
6-A	Do	do	do	Moncada			do	1,556.0522		1,556.0522	(a)	Moncada Cadastre, B. L. Case No. 2.
6-B	Do	do	do	do			do	1,516.3345		1,516.3345	(a)	Moncada Cadastre, B. L. Case No. 3.
1	Director of Forestry	10-19-22	Tayabas	Laguimanoc	10-23-22	7- 5-23	2-29-24	3,955.0000	1,930.0000	5,885.0000	P8,125.35	
2	Resolution No. 95, Municipal Council.	S. 1923	do	Unisan	do	do	do	5,672.0000	2,291.0000	7,963.0000	(b)	Most of Kalilayan River.
3	Director of Forestry	10-19-22	do	Atimonan	do	do	3- 1-24	13,281.8000	10,204.4800	23,486.2800	(b)	All except south and east of railroad line

4	Resolution No. 115, Municipal Council.	S. 1923	do	Mauban	do	do	3-25-24	7,286.6300	7,345.6200	14,632.2500	(b)	
5	Director of Forestry	10-19-22	do	Sampaloc	do	do	do	2,465.6300	1,093.7500	3,559.3800	(b)	
6	Do	do	do	Lucban	do	do	do	4,365.6300	1,512.5000	5,878.1300	(b)	
7	Do	do	do	Lopez	5-19-23	6-23-23	9-18-24	23,975.7960	8,740.8280	32,716.6240	₱139.15	
7-A	Do	do	do	do			11-8-24	82.7736		82.7736	(a)	Lopez Cadastre, Pr. S. Cadastal No. 1, under Project No. 7.
10	Do	do	do	Atimonan	7-13-23	11-22-23	3-1-24	1,192.0000	100.0000	1,292.0000	₱789.21	South and East of Siain.
11-B	Proclamation No. 51	S. 1920	do	Calauag			11-29-24	31.2700		31.2700	(a)	Extension of Block I of Tayabas Project 11 certified 9-15-21.
12	Director of Forestry	5-25-23	do	Casiguran	6-2-23	7-28-23	12-20-24	8,208.7500	175.0000	8,383.7500	₱263.84	Including Calabgan, Nueva Vizcaya.
15	Resolution No. 46, Municipal Council.	S. 1922	Tayabas	San Narciso	4-1-24	5-7-24	11-18-24	6,356.7000	1,035.0000	7,391.7000	144.80	
16	Director of Forestry	2-7-24	do	Mulanay	2-8-24	4-3-24	10-11-24	9,166.5020	556.0360	9,722.5380	573.13	
16-A	Proclamation No. 4	S. 1923	do	do			do		795.5199	795.5199	(a)	Bondoc Extension, B. L. Cadastre No. 172.
17	Resolution No. 9, Municipal Council.	S. 1921	do	Quezon	6-8-23	8-7-23	11-17-24	5,125.1200	2,293.7600	7,418.8800	₱293.44	
18	Director of Forestry	5-31-23	do	Alabat	8-8-23	9-25-23	do	8,299.5200	4,321.2800	12,620.8000	214.79	
21	Do	10-19-23	do	Pagbilao	10-23-22	7-5-23	5-21-24	8,477.0000	6,827.0000	15,304.0000	(b)	
22	Do	10-8-23	do	Catanauan	10-20-23	12-18-23	8-20-24	13,674.1273	30,166.9248	43,841.0521	₱99.80	
26-A	Proclamation No. 4	S. 1923	do	Tayabas			10-29-24	42.6903		42.6903	(a)	Tayabas Cadastre, B. L. Case No 1.
26-B	Do	do	do	do			10-4-24	993.8955		993.8955	(a)	Tayabas Cadastre, B. L. Case No. 2.
26-C	Do	do	do	do			do	1,044.8713		1,044.8713	(a)	Tayabas Cadastre, B. L. Case No. 3.
26-D	Do	do	do	do			9-30-24	930.2138		930.2138	(a)	Tayabas Cadastre, B. L. Case No. 4.
26-E	Do	do	do	do			10-29-24	1,035.9378		1,035.9378	(a)	Tayabas Cadastre, B. L. Case No. 5.
26-F	Do	do	do	do			10-28-24	1,124.6134		1,124.6134	(a)	Tayabas Cadastre, B. L. Case No. 6.

[a] No expenses covering field work are given, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

[b] Expenses are included in Tayabas Project No. 1.

Statement of land classification projects certified during the year 1924—Continued

Project No.	Requested		Regions		Field work		Certified to the Director of Lands on—	Approximate area classified in hectares			Total expenses excluding salaries	Remarks
	By—	Date	Provinces	Municipalities	Begun	Completed		Alienable and disposable	Timber land	Total		
26-G	Proclamation No. 4	S. 1923	Tayabas	Tayabas			10-28-24	1,005.1714		1,005.1714	(a)	Tayabas Cadastre, B. L. Case No. 7.
26-I	Do	do	do	do			10-28-24	1,110.3682		1,110.3682	(a)	Tayabas Cadastre, B. L. Case No. 9.
26-J	Do	do	do	do			11-22-24	1,485.5630		1,485.5630	(a)	Tayabas Cadastre, B. L. Case No. 10.
26-K	Do	do	do	do			11-28-24	908.6971		908.6971	(a)	Tayabas Cadastre, B. L. Case No. 11.
26-L	Do	do	do	do			do	685.7428		685.7428	(a)	Tayabas Cadastre, B. L. Case No. 12.
26-M	Do	do	do	do			do	1,147.2808		1,147.2808	(a)	Tayabas Cadastre, B. L. Case No. 13.
27-B			do	Sariaya			11-13-24	5,937.4690		5,937.4690	(a)	Sariaya Cadastre, B. L. Case No. 2.
27-C			do	do			do	3,185.0582		3,185.0582	(a)	Sariaya Cadastre, B. L. Case No. 3.
27-D	Proclamation No. 4	S. 1923	do	do			11-22-24	7,366.6148		7,366.6148	(a)	Sariaya Cadastre, B. L. Case No. 4.
28-A			do	Lucena			11- 8-24	836.9700		836.9700	(a)	Lucena Cadastre, B. L. Case No. 1.
28-B			do	do			do	1,987.6363		1,987.6363	(a)	Lucena Cadastre, B. L. Case No. 2.
28-D			do	do			do	1,461.7287		1,461.7287	(a)	Lucena Cadastre, B. L. Case No. 4.
28-E			do	do			do	976.8265		976.8265	(a)	Lucena Cadastre, B. L. Case No. 5.
26-N	Proclamation No. 4	S. 1923	do	Tayabas			12-31-24	1,466.3656	2,827.9359	4,294.3015	(a)	Tayabas Cadastre, B. L. Case No. 14.
26-O	Do	do	do	do			do	1,142.9509	1,791.5566	2,934.5075	(a)	Tayabas Cadastre, B. L. Case No. 15.
26-P	Do	do	do	do			do	799.1814	31.5318	830.7132	(a)	Tayabas Cadastre, B. L. Case No. 16.
2-A	Proclamation No. 4	S. 1923	Zambales	San Antonio			10- 1-24	387.1551		387.1551	(a)	San Antonio Cadastre, B. L. Case No. 1.
2-B	Do	do	do	do			10-17-24	1,073.5049	1,246.4382	2,319.9431	(a)	San Antonio Cadastre, B. L. Case No. 2.
2-C	Do	do	do	do			10- 1-24	1,222.1537		1,222.1537	(a)	San Antonio Cadastre, B. L. Case No. 3.

2-D	Do	do	do	do			do	817.8048		817.8048	(a)	San Antonio Cadastre, B. L. Case No. 4.
2-E	Do	do	do	do			do	852.5516		852.5516	(a)	San Antonio Cadastre, B. L. Case No. 5.
2-F	Do	do	do	do			do	552.0056		552.0056	(a)	San Antonio Cadastre, B. L. Case No. 6.
3-A	Do	do	do	San Narciso			do	230.5100		230.5100	(a)	San Narciso Cadastre, B. L. Case No. 1.
3-B	Do	do	do	do			do	642.4885		642.4885	(a)	San Narciso Cadastre, B. L. Case No. 2.
-C	Do	do	do	do			do	637.0039		637.0039	(a)	San Narciso Cadastre, B. L. Case No. 3.
3-D	Do	do	do	do			do	494.2021		494.2021	(a)	San Narciso Cadastre, B. L. Case No. 4.
3-E	Do	do	do	do			do	649.5993		649.5993	(a)	San Narciso Cadastre, B. L. Case No. 5.
3-F	Do	do	do	do			do	882.0825		882.0825	(a)	San Narciso Cadastre, B. L. Case No. 6.
3-G	Do	do	do	do			9-30-24	1,053.5711		1,053.5711	(a)	San Narciso Cadastre, B. L. Case No. 7.
13-A	Proclamation No. 67	S. 1920	Zamboanga	Margosatubig			11-26-24	4,295.1565		4,295.1565	(a)	Dinas Cadastre, B. L. Cadastral No. 113.

[a] No expenses covering field work are given, as the project was certified according to the information previously acquired and filed in the Bureau of Forestry.

Statement of land classification projects pending on December 31, 1924

Province	Municipality	Number of—		Status
		Project	B. L.	
Abra	Dolores	4		Field work in progress.
Do	La Paz	7		Do.
Do	Lagayan	6		Do.
Do	Danglas	3		Do.
Agusan	Talacogon	1		Pending tracing.
Do	Baylo	2		Do.
Do	La Paz	3		Do.
Do	Cabadbaran	4		Do.
Do	Jabonga	5		Do.
Do	Cabadbaran	4-A		Field work in progress.
Do	Jabonga	5-A		Do.
Albay	Albay	3		Pending tracing.
Do	Manito	4		Do.
Do	Albay	3-C	Case No. 3	Pending report.
Antique	San Jose de Buena vista.	9		Field work in progress.
Do	Sibalom	11		Do.
Do	San Remigio	10		Do.
Apayao	Tawit	5-A-B-C-D-E-F.		Pending tracing.
Bataan	Pilar	7-A		Do.
Do	Orion	16-A		Do.
Batangas	Balayan	1-A	Case No. 3	Pending report.
Bukidnon	Malitbog	1		Pending tracing.
Do	Sumilao	7		Do.
Do	Baungon	2		Do.
Do	Talakag	4		Do.
Do	Guinbaluron	5		Do.
Do	Libona	3		Do.
Do	Maluko	6		Do.
Do	Impasugong	8		Do.
Do	Malaybalay	10		Field work in progress.
Do	Maramag	9		
Cagayan	Gattaran	1-A		Pending tracing.
Do	do	1-B		Do.
Do	do	1-C		Pending compilation.
Camarines Sur	Tinambac	1		Pending tracing.
Do	Lagonoy	2		Do.
Do	San Jose	3		Do.
Do	Goa	5		Do.
Do	Calabanga	4-A		Do.
Do	Tigaon	6		Do.
Do	Sagnay	7		Do.
Do	Baao	8		Do.
Do	Pili	9		Do.
Do	Siruma	10		Do.
Cebu	Carcar	7-A	Case No. 1	Pending certification.
Do	do	7-B	Case No. 3	Do.
Do	Cebu	3-A	Case No. 1	Do.
Do	do	3-B	Case No. 5	Do.
Do	Bogo	3-A	Case No. 1	Do.
Do	do	3-B	Case No. 2	Do.
Cotabato	Awang	12-A		Pending tracing.
Do	do	12-B		Do.
Do	Lebak	35		Do.
Do	do	35-A		Do.
Do	Talayan	17-A		Do.
Do	Tambao	18-A		Do.
Do	Maganoy	24-A		Do.
Do	Dinaig	19		Do.
Catanduanes	Virac	7		Pending compilation.
Davao	Guianga	2		Pending tracing.
Do	Lupon	7		Tracing in progress.
Do	Pantucan	8		Do.
Do	Mati	9		Pending report.
Do	Manay	4		Do.
Do	Caraga	10		Do.
Do	Baganga	11		Do.
Do	Cateel	12		Do.
Ifugao	Lamut Valley Kiangan.	1		Pending tracing.
Ilocos Sur	Candon	7-C	Case No. 3	Pending report.
Do	do	7-E	Case No. 5	Do.
Do	do	7-F	Case No. 6	Do.
Do	do	7-I	Case No. 9	Do.
Do	do	7-J	Case No. 10	Do.
Do	Magsingal	13-E	Case No. 5	Do.
Do	do	13-F	Case No. 6	Do.
Do	do	13-G	Case No. 7	Do.
Do	do	13-H	Case No. 8	Do.

Statement of land classification projects pending on December 31, 1924—Ctd

Province	Municipality	Number of—		Status
		Project	B. L.	
Ilocos Sur	Santa Lucia	22–D	Case No. 4	Pending report.
Do	do	22–E	Case No. 5	Do.
Do	do	22–F	Case No. 6	Do.
Do	do	22–G	Case No. 7	Do.
Iloilo	Dumangas	43–A	Case No. 1	Pending certification.
Do	do	43–B	Case No. 2	Pending report.
Do	do	43–C	Case No. 3	Do.
Do	do	43–D	Case No. 4	Do.
Do	do	43–E	Case No. 5	Do.
Do	do	43–F	Case No. 6	Pending certification.
Do	do	43–G	Case No. 7	
Do	do	43–H	Case No. 8	
Do	do	43–I	Case No. 9	Pending report.
Do	do	43–J	Case No. 10	Do.
Laguna	Longos	5–A	Case No. 1	Do.
Do	do	5–B	Case No. 2	Do.
Do	do	5–C	Case No. 3	Pending certification.
Do	do	5–D	Case No. 4	Do.
Do	Paete	.....	Case No. 187	Pending report.
Do	San Pablo	24	.....	Compilation in progress.
Do	Calauang	12	.....	Do.
Do	Bay	6	.....	Do.
Do	Los Baños	15	.....	Do.
Do	Pila	22	.....	Do.
Do	Santa Cruz	1	.....	Do.
Do	Pagsanjan	6	.....	Do.
Do	Magdalena	17	.....	Do.
Do	Cavinti	3	.....	Do.
Do	Luisiana	16	.....	Do.
Do	Nagcarlang	19	.....	Do.
Do	Lilio	14	.....	Do.
Do	Majayjay	18	.....	Do.
Do	Calamba	11	.....	Do.
Do	Alaminos	7	.....	Do.
Lanao	Malabang	11	.....	Pending report.
Do	Tamparan	36	Case No. 111	Do.
La Union	Aringay	3–D	Case No. 4	Pending certification.
Do	do	3–E	Case No. 5	Do.
Do	do	3–F	Case No. 6	Do.
Do	Santo Tomas	4–A	Case No. 1	Do.
Masbate	Cataiñgan	1	.....	Tracing in progress.
Do	Milagros	4–B	.....	Do.
Do	San Fernando	5	.....	Do.
Do	San Jacinto	6	.....	Do.
Mindoro	Sablayan	17	.....	Field work in progress.
Do	Mamburao	15	.....	Do.
Do	Paluan	16	.....	Do.
Do	Abra de Ilog	12	.....	Do.
Do	Lubang	14	.....	Do.
Do	Puerto Galera	11	.....	Do.
Misamis	Gingoog	1	.....	Pending compilation.
Do	Talisayan	2	.....	Do.
Do	Salay	3	.....	Do.
Do	Barrio Napaliran	4	.....	Do.
Do	Balingasag	5	.....	Do.
Do	Claveria	6	.....	Do.
Do	Tagoloan	7	.....	Pending report and sketch.
Do	Cagayan	8	.....	Pending tracing.
Do	Barrio Lourdes	9	.....	Do.
Do	Initao	10	.....	Do.
Do	Barrio Lumbia	14	.....	Do.
Do	Mananum	15	.....	Do.
Do	Misamis	20	.....	Field work in progress.
Do	Clarin	18	.....	Do.
Do	Tudela	23	.....	Do.
Do	Jimenez	19	.....	Do.
Do	Aloran	16	.....	Do.
Do	Oroquieta	21	.....	Do.
Do	Plaridel	22	.....	Do.
Do	Baliangao	17	.....	Do.
Occidental Negros	Himamaylan	19–A	Case No. 1	Pending report.
Do	do	19–B	Case No. 2	Do.
Do	Cadiz	20–A	Case No. 1	Pending certification.
Do	do	20–B	Case No. 2	Do.
Do	Escalante	21–B	Case No. 2	Do.
Do	do	21–C	Case No. 3	Do.
Do	Sagay	25	Exp. 27	Do.

Statement of land classification projects pending on December 31, 1924—Ctd.

Province	Municipality	Number of—		Status
		Project	B. L.	
Oriental Negros	Dumaguete	1–C	Case No. 5	Pending certification.
Do	Bais	18	Case No. 115	Do.
Do	Tanjay	3–A	Case No. 5	Do.
Nueva Vizcaya	Bambang	4		Pending tracing.
Do	Bagabag	1–A		Do.
Do	Aritao	6–A		Do.
Do	Bayombong	3–A		Do.
Do	Solano	2–A		Do.
Do	Santa Cruz	8		Do.
Do	Imugan	7		Do.
Do	Dupax	5–A		Do.
Palawan	Bacuit	5	G. L. R. O. 93	Pending compilation.
Pampanga	Porac	16	Case No. 156	Do.
Pangasinan	Bayambang	37	Ipd. 92	Do.
Rizal	Montalban	7	G. L. R. O. 107	Do.
Sulu	Parang	2–A	Case No. 1	Do.
Do	Patikul etc	4–A	Case No. 1	Do.
Do	do	4–B	Case No. 2	Do.
Sorsogon	Sorsogon	1		Pending tracing.
Do	Bacon	2		Do.
Do	Castilla	3		Do.
Do	Sorsogon	1–A		Do.
Do	Bacong	2–A		Do.
Do	Castilla	3–A		Do.
Surigao	Surigao	14		Field work in progress.
Do	Placer	13		Do.
Do	Gigaquit	7		Do.
Do	Cantilan	3		Do.
Do	Tandag	16		Do.
Do	Tago	15		Do.
Tarlac	Moncada	6–C		Pending tracing.
Tayabas	Basiad, Calauag	11–A		Do.
Do	Unisan	2–A		Pending compilation.
Do	Gumaca	8		Do.
Do	Pitogo	9		Do.
Do	Macalelon	13		Do.
Do	Tayabas	26–H	Case No. 8	Do.
Do	Polillo	19		Suspended.
Do	Guinayangan	20–A		Pending tracing.
Zamboanga	Isabela	3	Case No. 114	Tracing in progress.
Do	Zamboanga	5	Case No. 1	Do.
Do	do	5–A	Case No. 2	Do.
Do	Taluksangay	18		Do.
Do	Dipolog	2		Pending tracing.
Do	Lubungan	4		Pending compilation.
Do	Sindangan	16		Do.
Do	Panganuran	14		Pending tracing.
Tarlac	Moncada	6–C	Case No. 4	Pending compilation.

Statement of land classification projects certified to the Bureau of Lands since the enactment of the new public land law on November 29, 1919, to December 31, 1924

Provinces	Before 1924		During 1924		Total	
	Total number of projects	Area in hectares	Total number of projects	Area in hectares	Total number of projects	Area in hectares
Abra						
Agusan	1	42,265.80			1	42,265.80
Albay–Catanduanes	2	791.16	16	36,558.97	18	37,350.13
Antique						
Bataan	6	15,914.03	12	35,928.95	18	51,842.98
Batanes						
Batangas	2	2,235.37	11	38,827.19	13	41,062.56
Bohol						
Bukidnon	1	2,488.40			1	2,488.40
Bulacan			9	29,398.27	9	29,398.27
Cagayan	1	220,074.00	9	21,484.63	10	241,558.63
Camarines Norte	1	6,022.00	8	60,021.28	9	66,043.28
Camarines Sur	1	33,809.00			1	33,809.00
Capiz			10	41,866.97	10	41,866.97

Statement of land classification projects certified to the Bureau of Lands since the enactment of the new public land law on November 29, 1919, to December 31, 1924—Continued

Provinces	Before 1924		During 1924		Total	
	Total number of projects	Area in hectares	Total number of projects	Area in hectares	Total number of projects	Area in hectares
Cavite	2	65.09			2	65.09
Cebu	7	5,129.91	5	11,581.45	12	16,711.36
Cotabato	13	39,544.87	19	106,190.36	32	145,735.22
Davao	1	33,194.11	2	59,581.60	3	92,775.71
Ilocos Norte	5	890.96	2	317.21	7	1,208.17
Ilocos Sur			13	6,786.89	13	6,786.89
Iloilo	29	35,892.12	7	57,340.44	36	93,232.56
Isabela	2	254,645.00	1	963.47	3	255,608.47
Laguna	2	2,892.84	6	3,077.65	8	5,970.49
Lanao	2	44,397.00	1	7,200.04	3	51,597.04
La Union	2	7,591.80	5	3,273.70	7	10,865.50
Leyte	4	38,218.88	1	21.23	5	38,240.11
Marinduque						
Masbate			4	307,555.27	4	307,555.27
Mindoro	2	45,579.00	7	130,881.68	9	176,460.68
Misamis	1	7,277.00			1	7,277.00
Mountain Province:						
Apayao	1	20,520.00			1	20,520.00
Benguet						
Bontoc						
Ifugao						
Kalinga	1	7,632.00			1	7,632.00
Nueva Ecija	41	315,110.74			41	315,110.74
Nueva Vizcaya	8	56,079.27	2	1,537.71	10	57,616.98
Occidental Negros	17	266,408.52	13	48,554.84	30	314,963.36
Oriental Negros	3	7,506.89	18	76,294.73	21	83,801.62
Palawan	4	4,726.09			4	4,726.09
Pampanga	9	43,937.00	10	27,286.10	19	71,223.10
Pangasinan	25	20,667.51	5	26,722.34	30	47,389.85
Rizal	5	2,148.14	1		6	2,148.14
Romblon						
Samar	1	9,820.00			1	9,820.00
Sorsogon	1	1,616.00			1	1,616.00
Sulu			5	32,995.85	5	32,995.85
Surigao						
Tarlac	9	42,032.97	30	55,700.43	39	97,773.40
Tayabas	3	60,980.73	40	242,331.69	43	303,312.42
Zambales	1	7,853.12	13	10,777.02	14	18,630.14
Zamboanga	9	8,051.31	1	4,295.15	10	12,346.46
Total	225	1,714,008.63	286	1,485,353.11	511	3,199,361.74

Fiscal year	Area in Hectares
1920	10,390.00
1921	11,741.48
1922	2,781.31
1923	73,113.43
1924	280,645.19

PUBLIC LAND APPLICATIONS

The policy heretofore adopted on the inspection of public lands applications in the provinces open for disposition under the new Public Land Law and those which, in the opinion of the Director of Lands, cannot be definitely identified within the areas already classified and certified was continued up to September 18, 1924, the Bureau of Lands having stopped since then the sending of such applications to this Bureau for certification.

However, in view of Proclamation No. 7 of the Governor-General, dated February 6, 1924, declaring that all public lands covered by the applications received and recorded in the Bureau of Lands on or before December 31, 1923, subject to future classification, delimitation, and survey, are open to concession or disposition through homestead, purchase, and lease, the number of public lands applications received in this Office for certification regarding the forestry value of the land has again materially increased. These applications are generally located outside the classified areas and in regions considered as classed before the said proclamation.

During the year, 3,862 parcels of public lands were certified as compared with 15,143 in 1923. There are pending for inspection 4,062 applications against 2,753 of the previous year. Detailed statements will be found in Appendix No. 1.

The result of the work on the inspection of public lands applications is the most that could be accomplished under the circumstances.

The amount of pending work at the end of the year as stated above is due to the fact that nearly three-fourths of the pending applications were received in this Office at the time of the rainy season and also at the latest part of the year when it was practically a physical impossibility to attend to them. Besides, it should also be stated that the majority of these applications are isolated and located in far-away places outside the classified territories and in not a few instances, the means of communication are difficult and the applicants' whereabouts unknown.

FOREST LAND CASES

Due to the general increase in the number of applications for land registration submitted to the courts and scheduled for hearing during the year for adjudication, both under Acts 496 and 2259, there has been an increase in the activities of this division as regards the presentation of opposition to the perfecting of titles in the courts of forest lands subject to the provisions of section 1820 of the Administrative Code.

There was no appreciable change in the procedure as reported in the previous year with respect to presentation of opposition to forest land registration in the courts. In accordance, however, with the arrangement made between the Bureaus of Lands and Forestry during the middle part of the year, wherein the Bureau of Lands first lends to this Office the

tracings of every cadastral survey before forwarding same to the General Land Registration Office for records, this division has been able to determine, with ample time, whether or not a given survey includes forest areas. This procedure has helped a great deal in that the division has been able to order the inspection and present the necessary opposition in due form and time, thereby avoiding the presentation of opposition (in cadastral cases) without having first investigated on the ground the condition of the land and later withdraw such opposition, if found unwarranted upon actual examination, which had been the case in previous years.

There were received, during the year, from the General Land Registration Office 93 cadastral and 1,764 ordinary cases as compared with 89 cadastral and 1,630 ordinary cases received during the year 1923. Of the said cases, 43 cadastral and 55 ordinary cases were inspected during the year as compared with 65 cadastral and 34 ordinary cases inspected during the year 1923. The other cases were not inspected as they are positively agricultural land according to the forest data in the record of this Office. The above figures show that there is a slight decrease in the number of cases inspected on the ground as compared with those of the last year. This decrease is due principally to the fact that several cases are within the regions already inspected and investigated in connection with land-classification work; hence, inspection in connection with the presentation of opposition was dispensed with.

After actual investigation on the ground of the said 43 cadastral and 55 ordinary cases, opposition to 24 cadastral and 20 ordinary cases was sustained; and opposition to the other cases was withdrawn for obvious reasons.

With regard to ordinary cases, this division has repeatedly mentioned in previous reports the inconveniences it suffered in suspending important work so as to attend to the rush demands of their hearings, because of the limited time between the date a given case is set for trial and the date upon which the notice of hearing is received. The proper procedure with a view to reduce these inconveniences is at present under consideration between this Bureau and the General Land Registration Office, and it is hoped that it will soon be remedied by the insertion of another column in the present Judicial Form No. 75, G. L. R. O. Form No. 4, indicating the number of the plan corresponding to the expediente or by requiring the ap-

plicant to accompany his application for registration with an extra blue-print map of the land for official use of the Bureau of Forestry.

Pursuant to Proclamation No. 4, series of 1923, by the Governor-General, declaring all lands, except forest lands, which have been or may thereafter be declared by the competent courts as public lands in cadastral and other land-registration cases, open to concession or disposition under the provisions of section 7 of Act 2874, this division has ordered the inspection of cadastral cases both for the purpose of presenting opposition in court and certifying them to the Director of Lands under the said proclamation. The certification of cadastral cases has increased to a great extent the activities of the division during the year.

As can be seen in the table following, there have been 146 cases sent for inspection, of which 57 cases were still pending inspection and report on December 31, 1924. Out of the said 57 pending cases, 48 are not as yet scheduled for hearing in the courts, and consequently, the necessary action has been left in abeyance. Tabular statement of these cases here follows:

Table showing the status and number of ordinary and cadastral cases received and pending during the year 1924

	Ordinary			Cadastral			Total		
	Number of cases	Number of lots	Area in hectares	Number of cases	Number of lots	Area in hectares	Number of cases	Number of lots	Area in hectares
Cases pending hearing on December 31, 1923	22	85	2,435.1421	27	16,936	112,221.8698	49	17,021	114,657.0119
Cases received from General Land Registration Office	1,764	4,341	26,125.6220	93	59,211	290,987.3620	1,857	63,552	317,112.9840
Cases acted upon although not scheduled for hearing in 1924				48	22,608	30,577.6338	48	22,608	30,577.6338
Total number of cases handled during 1924	1,786	4,426	28,560.7641	120	76,147	403,209.2318	1,806	80,573	431,769.9959
Cases pending report on December 31, 1924	6	13	728.1650	3	772	26,586.8225	9	785	27,314.9875
Cases without opposition	1,609	4,271	19,301.9418	50	9,330	41,421.0330	1,659	14,101	60,722.9748
Cases with opposition	55	70	6,823.6802	43	49,381	249,566.3290	98	49,451	256,390.0092
Cases opposition withdrawn after inspection	35	39	4,742.8515	19	49,004	235,971.2095	54	49,035	240,714.0610
Cases opposition sustained	20	31	2,080.8287	24	377	13,595.1195	44	416	15,675.9482
Cases lost	3	9	48.5001	2	2	13.6484	5	11	62.1485
Cases won	5	8	1,070.9558	4	4	21.3433	9	12	1,092.2991
Cases pending hearing on December 31, 1924	15	22	861.3728	37	371	13,560.1278	52	393	14,421.5006

FOREST RESERVES

The survey of Mounts Banahao and San Cristobal Forest Reserve, which was started in the middle part of the year 1923 and continued until December 31, 1924, was the only special work undertaken by the division during the year. It is believed that the said survey will be completed not later than March 31, 1925.

The necessary action on the proposed forest reserves reported in the 1923 annual report as pending preparation of maps and technical descriptions had been left in abeyance because the available personnel of the division was concentrated to land classification work. The clerical work necessary in connection with these reserves has also been left pending for the reason that the number of clerks of the division is inadequate to keep pace with the general increase in the activities of the division.

While no special effort was made during the year toward the establishment of forest reserves, except the survey of Mounts Banahao and San Cristobal Forest Reserve, steps had been taken incidentally in connection with the establishment of forest-zone corners by land classification parties in the course of their land classification work. The following statements show the work performed during the year on forest reserves:

Forest Reserve of Coal-bearing Districts in Alabat Island.—With the end of conserving and protecting the timber necessary for the development of the coal industry in this region, this area was set aside as a reserve on July 31, 1917, under Proclamation No. 31 by the Governor-General. Upon investigation of the area in connection with the land classification work undertaken in this region during the year, it was found that a portion of Parcel I of this reserve is held by individuals under legal claims, wherefore, on June 6, 1924, the exclusion of such claims from the said parcel was recommended to the Governor-General, through the Secretary of Agriculture and Natural Resources. The matter is still pending approval.

Salinas Forest Reserve.—This reserve was proclaimed on May 18, 1914, and reported in the 1920 Annual Report. On the strength of the petition of the Provincial Board of Nueva Vizcaya in representation of various homeseekers, a portion containing 7,995,219 square meters was segregated from this reserve during the year. A part of this tract classified as alienable and disposable was also subdivided and monumented by this Bureau

in coöperation with the Bureau of Lands. This reserve as amended will be recommended for proclamations as soon as the corresponding plan is approved by the Director of Lands.

The Makiling National Botanic Garden.—This reserve was formerly designated as Makiling Forest Reserve and established under Proclamation No. 106, series of 1910, by the Governor-General. It was later designated as "The Makiling National Botanic Garden" under Proclamation No. 60 of November 30, 1920. On October 30, 1924, this Office recommended to the Secretary of Agriculture and Natural Resources the exclusion of an area of 5,000 square meters on both sides of Dipangla Creek, inside and adjoining the boundary of the reserve from corner 8 to corner 9, for the use of the Tanauan Waterworks and Sewers System in the municipality of Tanauan, Province of Batangas. On November 13, 1924, the amendment of the plan (Ipd-11) of this reserve, including a parcel of public land as School of Forestry Site and excluding the private property of E. B. Copeland, was submitted to the Bureau of Lands for approval. This Office has not been informed of the final action taken on the matter.

Masinloc Forest Station Site Reservation.—This reservation was proposed as a permanent forest station site and reported in the 1923 Annual Report. It was set aside as such on August 11, 1924, under Proclamation No. 23.

Proposed Mount Malaraya Forest Reserve.—This proposed reservation was first delimited in 1924 as a forest zone and reported in the 1914 Annual Report. In the latter part of the year 1924, the land adjoining the proposed forest reserve was thoroughly classified and the lands considered as alienable or disposable under Act 2874 were segregated as a result of which, this proposed reserve, as newly delimited, will be recommended for proclamation as timber land in the meantime that the accurate survey of same is not yet made.

Proposed Forest Reserve in the Municipalities of Manito, Albay, Bacon, Castilla, and Sorsogon, Provinces of Albay and Sorsogon.—This proposed reservation was laid out during this year in connection with the land classification work made in the Provinces of Albay and Sorsogon for the purpose of protecting that tract of forest land north of Sorsogon. A tentative map of this reserve has already been finished and same will be recommended for proclamation as timber land in the meantime that the accurate survey in conformity with the Bureau of Lands standard is not yet made.

The following is a complete list of all the forest reserves established or proposed as the case may be up to December 31, 1924:

Title	Provinces	Date of proclamation
Lamao Forest Reservation [a]	Bataan	Executive Order No. 33, July 26, 1904.
Atimonan Forest Park	Tayabas	Proclamation No. 2, January 28, 1913.
Salinas Forest Reserve	Nueva Vizcaya	Executive Order No. 44, May 18, 1914.
Forbes Forest Park	Benguet	Philippine Commission Resolution No. 119, October 12, 1915.
Limay Forest Station Site	Bataan	Executiv Order No. 34, April 11, 1917.
Forest Reservation on the coal-bearing district, Polillo Island.	Tayabas	Proclamation No. 31, July 31, 1917.
Forest Reservation on the coal-bearing districts, Alabat Island.	Tayabas	Proclamation No. 31, July 31, 1917.
Teak Reservation [b]	Sulu	Proclamation No. 42, October 31, 1918.
Kolambugan Forest Station Site	Lanao	Executive Order No. 85, December 3, 1919.
The Makiling National Botanic Garden [c]	Laguna and Batangas.	Proclamation No. 60, November 30, 1920.
Western Batan Island Forest Reserve	Albay	Proclamation No. 22, August 6, 1921.
Port Banga Forest Station Site	Zamboanga	Proclamation No. 28, August 27, 1921.
Mount Banahao and San Cristobal Forest Reserve. [d]	Laguna and Tayabas.	Proclamation No. 42, October 14, 1921.
Mount Arayat Forest Reserve [e]	Pampanga	Proclamation No. 42, October 14, 1921.
Busal Forest Reserve	Benguet	Proclamation No. 15, April 27, 1922.
The Cave Forest Reserve	do	Proclamation No. 16, April 27, 1922.
Forest Reserve for the Manila Railroad Company along the Calauag-Aloneros railroad line.	Tayabas	Proclamation No. 24, April 7, 1923.
Talavera Watershed Forest Reserve [f]	Nueva Ecija	Proclamation No. 47, August 29, 1923.
Mount Bankai Forest Reserve	do	Proclamation No. 66, October 20, 1923.
Talisay-Minglanilla Forest Reserve [g]	Cebu	
Northern Negros Forest Reserve [g]	Occidental Negros.	
Pagsanjan Gorge National Park [g]	Laguna	
Mount Amorong Forest Reserve [g]	Nueva Ecija and Pangasinan.	
Northern Masbate Forest Reserve [g]	Masbate	
Mount Bulaylay Forest Reserve [g]	Nueva Ecija	
Naga-naga Forest Station Site [g, h]	Zamboanga	
Reserve for the protection of mangrove swamps (10,000 hectares) in the municipalities of Dumangas Barotac Nuevo and Banate. [i]	Iloilo	
Buri Forest Reserve in the municipalities of San Antonio and Cabiao. [g]	Nueva Ecija	
Mount Malaraya Forest Reserve [g]	Batangas, Laguna and Tayabas.	
Forest Reserve between the municipalities of Manito, Albay, Bacon, Castilla and Sorsogon.	Albay and Sorsogon.	

[a] Amended by Proclamation No. 8, July 12, 1919, excluding certain agricultural portions of the reserve for public use.

[b] Amended by Proclamation No. 52, series of 1923, excluding three parcels containing a total area of 1,259,100 square meters.

[c] Formerly designated as Makiling Forest Reserve Under Proclamation No. 106, series of 1910.

[d] An accurate survey of this reserve is in progress.

[e] Amended by Proclamation No. 67, October 25, 1923, revising the boundaries as defined in the old proclamation.

[f] Proclaimed as timber land, to be recommended as forest reserve as soon as an accurate survey of same is made.

[g] Preliminary examination and survey finished; to be recommended for proclamation either as timber land or as forest reserve.

[h], [i] Request made for accurate survey to the Director of Lands on February 17, 1919, and July 22, 1918, respectively.

PRIVATE WOODLANDS REGISTRATION CASES

In accordance with section 1829 of the Administrative Code, 52 certificates of registration, covering 116 parcels of land with a total area of 13,751 hectares, 50 ares, and 41 centares, were issued during the year 1924, of which 4,033 hectares, 41 ares, and 73 centares are highland forest, and 855 hectares, 15 ares, and 41 centares are mangrove swamps, showing a considerable increase over the previous year. Aside from this, there were issued 14 provisional certificates of forest registration covering 44 parcels of land with a total area of 2,081 hectares, 62 ares, and 38 centares.

The total area covered by the provisional and proper certificates of forest registration issued in 1924 is 3,754 hectares, 77 ares, and 4 centares more than that in the preceding year.

With a view to determine their legality for inscription in this Bureau, the greater part of the work in this section during the year consisted in the preparation of correspondence on forest land claims, the majority of which were based on mere assertions and occupancy together with tax receipts. A considerable number of such claims have not been registered in view of the failure of the claimants to present proper titles as required by law, and there has been declared as a part of the public forest under section 1820 of the Administrative Code, a total area of 164 hectares, 5 ares, and 23 centares.

This division, in addition to the above, challenged 434 claimants of private forest lands, which, according to report from forest officers, are located within the proposed and established forest zones, communal forest and areas applied for by prospective forestry licensees. They were requested to submit their titles or documents evidencing their rights thereto in accordance with section 1829 of the Administrative Code, either for the purpose of registration in this Bureau or to enable this Office to determine whether or not such claimed lands are a part of the public forests under section 1820 of the same code. Of these new claims, plus 406 claims pending at the end of the year 1923, making a total of 840, 198 were rejected and declared for administrative purposes as a part of the public forests and 41 were considered as entitled to the benefits of either sections 41 or 45 (*b*) of Act No. 2874, or section 1513 of the Administrative Code, leaving a total of 239 claims with final action at the end of the year. Therefore, there were 601 claims pending on December 31, 1924, as compared with 406 claims at the end of the previous year. The reason for this is

the failure of the claimants to comply with our requests and the delay in sending tracers was due to the insufficiency of clerical force. A number of instances have been found when tracers were unnecessarily delayed from two to six months, while under ordinary circumstances they should have been attended to within one month from the time a particular claimant was challenged.

The following table shows the private woodland registered up to December 31, 1924:

Calendar year—	Number of—			
	Parcels	Hectares	Ares	Centares
1900	420	20,643	68	51
1901	201	68,386	06	95
1902	23	16,412	27	44
1903	3	1,305	94	65
1904	8	29,228	47	82
1905	12	6,631	63	89
1906	21	12,736	95	24
1907	17	28,338	73	05
1908	10	535	97	53
1909	14	6,115	86	62
1910	4	8,653	85	22
1911	5	5,533	67	26
1912	14	6,552	34	89
1913	26	15,229	58	36
1914	16	23,230	05	07
1915	27	13,304	36	95
1916	37	51,663	77	49
1917	48	7,985	68	39
1918	84	43,213	17	26
1919	110	14,943	71	39
1920	41	47,723	82	90
1921	53	11,552	48	87
1922	44	3,493	81	54
1923	40	12,078	35	75
1924	116	13,751	50	41
Total	1,394	469,245	83	45

COMMUNAL FORESTS

In accordance with section 1839 of the Administrative Code, 150 parcels of communal forest, with a total area of 76,816 hectares, were established this year as compared with 100 parcels with a total area of 11,912 hectares for 1923, showing a considerable increase over the previous year. This is due to the fact that there were numerous requests from several municipalities for the establishment of new and additional parcels of communal forest, besides those laid out in conjunction with the land classification work.

The following is a complete statement of the work accomplished and the status of pending work on communal forests at the end of the year:

Number of parcels pending on December 31, 1924	191
Number of parcels requested for establishment in 1924	71
Total	262

Number of parcels proclaimed in 1924 125
Number of parcels pending survey and report on December 31, 1924 69
Number of parcels reported but pending final action in the central office 54
Number of parcels surveyed but report pending 19
Number of parcels of communal forest inspected and reported up to December 31, 1924 20

The total number of communal forests established up to December 31, 1924, amounts to 1,275, distributed among the different provinces as shown in the following table:

Statement of communal forests established up to December 31, 1924

Provinces	Parcels established		Total parcels established up to 1924	Municipalities and municipal districts			Cancelled	
	Before 1924	During 1924		With communal forest	Without communal forest	Area in hectares of parcels established up to 1924	Parcels	Hectares
Abra	32	.....	32	18	21	6,110.00	1	316.00
Agusan	6	4	10	8	50	1,158.00	.....	.....
Albay—Catanduanes [a]	41	3	44	19	7	3,547.00	5	574.00
Antique	6	.....	6	6	7	1,406.00	.....	.....
Bataan	17	.....	17	12	.....	5,141.40	2	464.00
Batanes	.....	5	5	3	3	580.00	.....	.....
Batangas	2	.....	2	1	24	136.00	.....	.....
Bohol	49	4	53	32	4	6,363.80	1	118.50
Bukidnon	1	1	2	2	10	812.00	.....	.....
Bulacan	3	.....	3	3	21	500.16	1	232.16
Cagayan [a]	54	8	62	23	2	8,565.60	5	590.00
Camarines Norte	8	2	10	8	1	1,339.00	.....	.....
Camarines Sur	51	7	58	29	2	64,680.00	1	175.00
Capiz	36	4	40	21	5	3,731.00	1	88.00
Cavite	1	.....	1	1	19	252.00	.....	.....
Cebu	35	5	40	19	33	2,426.40	.....	.....
Cotabato	.....	.....	.....	.....	37	.....	.....	.....
Davao	11	3	14	6	17	1,516.00	.....	.....
Ilocos Norte [a]	28	2	30	16	15	11,699.00	6	1,877.00
Ilocos Sur	44	8	52	33	14	9,933.00	5	3,612.00
Iloilo	23	5	28	16	20	3,354.00	2	596.00
Isabela	22	2	24	14	13	4,070.00	3	416.00
Laguna	16	.....	16	11	17	2,252.00	.....	.....
Lanao	3	1	4	3	35	1,193.00	2	800.00
La Union	23	10	33	16	4	7,350.24	4	1,154.00
Leyte [a]	83	5	88	34	12	8,098.00	1	85.60
Marinduque	12	1	13	4	2	1,632.00	.....	.....
Masbate	30	1	31	8	.....	2,066.00	1	80.00
Mindoro	26	6	32	12	6	3,318.00	.....	.....
Misamis	26	1	27	21	37	3,971.00	.....	.....
Mountain Province:								
Apayao	4	2	6	2	3	971.00	.....	.....
Benguet	5	.....	5	1	10	148.00	.....	.....
Bontoc	1	.....	1	1	14	180.00	.....	.....
Ifugao	2	.....	2	1	4	556.00	.....	.....
Kalinga	.....	1	1	1	3	480.00	.....	.....

[a] Due to public calamity, the communal forests of Bato, Calolbon, Pandan, Panganiban, and Virac, Province of Albay, were suspended temporarily from December 10, 1923, to December 31, 1924; Abulug, Alcala, Amulung, Aparri, Baggao, Ballesteros, Buguey, Claveria, Camalaniugan, Faire, Gattaran, Gonzaga, Iguig, Lal-lo, Lagangan, Pamplona, Peñablanca, Piat, Rizal, Solana, Sanchez Mira, Tuao, and Tuguegarao, Province of Cagayan, from October 9, 1924, to June 30, 1925; Calayan, Cagayan, from June 16, 1924, to December 31, 1924; Bangui, Province of Ilocos Norte, from December 2, 1924, to September 30, 1925; Abuyug, Province of Leyte, from November 8, 1924, to March 31, 1925; Allen, Province of Samar, from January 15, 1924, to December 31, 1924; Calbiga, Samar, from October 9, 1924, to June 30, 1925; Balangiga, Borongan, Guiuan, Hermani, Llorente, Oras, Salcedo, San Julian, and Sulat, Samar, from October 25, 1924, to June 30, 1925; Bobon, Samar, from January 9, 1924, to December 31, 1924; Pambujan, Samar, from June 30, 1924, to December 31, 1924; Wright, Samar, from June 23, 1924, to December 31, 1924; and Laoang, Samar, from March 11, 1924, to December 31, 1924.

Statement of communal forests established up to December 31, 1924—Continued

Province	Parcels established		Total parcels established up to 1924	Municipalities and municipal districts			Cancelled	
	Before 1924	During 1924		With communal forest	Without communal forest	Area in hectares of parcels established up to 1924	Parcels	Hectares
Nueva Ecija	32	4	36	25	35	7,837.00	4	698.00
Nueva Vizcaya	19	7	26	8	12	3,891.00	.....	.....
Occidental Negros	32	1	33	14	12	3,633.00	1	240.00
Oriental Negros	27	5	32	20	78	2,333.00	1	76.00
Palawan	7	7	14	2	14	2,710.00	.....	.....
Pampanga	3	.....	3	3	18	395.00	.....	.....
Pangasinan	59	5	64	38	26	16,345.00	4	1,225.48
Rizal	16	1	17	9	18	1,451.40	1	76.00
Romblon	10	.....	10	7	2	1,110.00	1	60.00
Samar [a]	66	7	73	36	9	9,867.00	2	188.00
Sorsogon	21	.....	21	13	3	1,758.00	.....	.....
Sulu	.....	.....	.....	.....	29	.....	.....	.....
Surigao	29	6	35	13	18	4,085.00	2	182.00
Tarlac	12	2	14	10	7	2,452.00	1	265.00
Tayabas	64	6	70	22	6	6,198.00	4	555.00
Zambales	22	3	25	13	.....	5,173.00	1	300.00
Zamboanga	5	5	10	3	15	956.00	1	9.00
Total	1,125	150	1,275	641	774	239,730.48	64	15,052.00

[a] Due to public calamity, the communal forests of Bato, Calolbon, Pandan, Panganiban, and Virac, Province of Albay, were suspended temporarily from December 10, 1923, to December 31, 1924; Abulug, Alcala, Amulung, Aparri, Baggao, Ballesteros, Buguey, Claveria, Camalaniugan, Faire, Gattaran, Gonzaga, Iguig, Lal-lo, Lagangan, Pamplona, Peñablanca, Piat, Rizal, Solana, Sanchez Mira, Tuao, and Tuguegarao, Province of Cagayan, from October 9, 1924, to June 30, 1925; Calayan, Cagayan, from June 16, 1924, to December 31, 1924; Bangui, Province of Ilocos Norte, from December 2, 1924, to September 30, 1925; Abuyug, Province of Leyte, from November 8, 1924, to March 31, 1925; Allen, Province of Samar, from January 15, 1924, to December 31, 1924; Calbiga, Samar, from October 9, 1924, to June 30, 1925; Balangiga, Borongan, Guiuan, Hermani, Llorente, Oras, Salcedo, San Julian, and Sulat, Samar, from October 25, 1924, to June 30, 1925; Bobon, Samar, from January 9, 1924, to December 31, 1924; Pambujan, Samar, from June 30, 1924, to December 31, 1924; Wright, Samar, from June 23, 1924, to December 31, 1924; and Laoang, Samar, from March 11, 1924, to December 31, 1924.

MAPPING AND DRAFTING

As in the previous years, this section has taken charge of the recording, indexing, filing and the gathering of data for purposes of statistics and mapping work from field notes and sketches submitted by field parties and those received from other entities of the Government. Owing to the increased activities in land classification with the consequent volume of field notes taken, this Section has been constantly busy in attending to the records and filing of such field notes and sketches submitted by the land classification parties. There has also been a notable increase in the number of sketches received which were taken in connection with the inspection of license areas, communal pastures and special permits. As in the preceding years, topographical data were taken in regions where no special work has been done previously for the purpose of gathering information for the compilation of forest maps.

Statement of communal forests established and cancelled up to December 31, 1924

	Parcels	Hectares
Total number of parcels and hectares established from 1908 to 1924	1,275	239,730.48
Total number of parcels and hectares cancelled in various years	64	15,052.00
Balance in force	1,211	224,678.48

Communal forests established from 1908 to 1924

Year	Parcels	Hectares	Year	Parcels	Hectares
1908	19	5,326.00	1918	81	7,704.82
1909	19	6,609.00	1919	63	10,537.35
1910	19	5,796.00	1920	69	9,008.85
1911	53	15,147.60	1921	95	10,322.20
1912	59	10,957.00	1922	214	21,245.00
1913	26	3,387.00	1923	100	11,912.00
1914	45	6,860.00	1924	150	76,815.66
1915	90	12,129.00			
1916	110	15,862.60	Total	1,275	239,730.48
1917	83	10,110.00			

The following table shows the total number of kilometers of trail notes and hectares of valuation surveys taken during the year in each of the forest districts of this Bureau:

District No.	Received		Pending		Total	
	Kilometers	Hectares	Kilometers	Hectares	Kilometers	Hectares
1	532.82	8.15	217.13	4.94	749.95	13.09
2	244.82	1.92	165.52	.....	410.34	1.92
3	143.22	2.50	150.23	.....	293.45	2.50
4	300.80	1.20	558.24	13.52	859.04	14.72
5	990.70	36.73	300.54	7.50	1,291.24	44.23
6	2,124.86	62.24	1,018.45	56.51	3,143.31	118.75
7	134.89	1.10	377.55	4.48	512.44	5.58
8	703.23	3.00	1,131.51	60.39	1,834.74	63.39
9	53.45	5.60	31.30	5.73	84.75	11.33
10	845.13	2.10	363.99	3.24	1,209.12	5.34
11	879.38	3.33	296.44	3.38	1,175.82	6.71
12	50.49	4.70	73.42	2.66	123.91	7.36
13	3,951.25	34.23	901.62	10.81	4,852.87	45.04
Total	10,955.04	166.80	5,585.94	173.16	16,540.98	339.96

As may be noted in the following comparative statement of the field notes and valuation surveys taken in 1923 and 1924, there is an increase of 1,939.5 kilometers of field notes taken during 1924 over that of the preceding year, while a decrease of 1,076.16 hectares of valuation surveys can be noted. This decrease in valuation surveys is due to the fact that most of the

regions traversed are covered only with noncommercial forests which do not necessarily require valuation survey, or similar regions which can be used as bases have already been surveyed in previous years. It may be stated, however, that as cited above, most of these surveys were taken in connection with land classification and for this line of work, they are sufficient for the proper determination of the forest value of the land, and in many cases, as the land has already been previously evaluated, no other survey was made except to mark the boundaries of the classified areas.

Comparative statement of field notes and valuation surveys taken in 1923 and 1924

Year	Received		Pending		Total	
	Kilometers	Hectares	Kilometers	Hectares	Kilometers	Hectares
1923	5,287.54	336.02	9,313.94	1,080.10	14,601.48	1,416.12
1924	10,955.04	166.80	5,585.94	173.16	16,540.98	339.96

In the work of compilation in the progressive forest maps of all topographical and forest data taken from various sources, little has been accomplished, and those reported as pending preparation in the previous year remained practically in the same status at the end of the year. It is regretted that this important work has, under the circumstances, been suspended in order to give preference to the preparation of land classification maps. It is hoped that during the coming year, this work will be revived in proportion to the personnel that may be assigned to this division.

It is noteworthy, however, that 55 maps of land classification projects and 95 of cadastral cases, classified and certified to the Director of Lands, were prepared during the year as compared with 16 maps of land classification projects and 150 of the cadastral cases in the previous years.

It must be mentioned herein that, in view of the lack of draftsmen, this Bureau was constrained at the middle of the year to seek the coöperation of the Bureau of Lands to furnish this Bureau with draftsmen to help in the preparation of tracings of land classification maps. As requested, the Bureau of Lands sent to this Office two draftsmen who since September 25, 1924, up to the end of the year have continuously rendered services to this Office.

The following is a comparative statement of the work accomplished in the Drafting Section which shows that, in general,

there is a greater volume of work accomplished this year than in the previous years:

	Sheet
Progressive forest maps:	
Scale 1 : 100,000—1° × 30′ = 45′ × 25′	162
On drawing paper:	
Pending preparation on December 31, 1923	17
Prepared during 1924	0
Pending preparation on December 31, 1924	17
On tracing cloth:	
Pending on December 31, 1923	94
Prepared during 1924	0
Pending preparation on December 31, 1924	94
Scale 1 : 20,000—10′ × 10′ = 38′ × 38′	1,481
On drawing paper:	
Pending preparation on December 31, 1924	1,357
Prapared during 1924	6
Pending preparation on December 31, 1924	1,351
On tracing cloth:	
Pending preparation on December 31, 1924	1,393
Prepared during 1924	0
Pending preparation on December 31, 1924	1,393
Special Maps:	
Communal forest:	
Pending on December 31, 1923	35
Received during 1924	102
Total	137
Completed during 1924	97
Pending on December 31, 1924	40
Land Classification:	
Pending on December 31, 1923	25
Received during 1924:	
Forestry data	105
Cadastral cases	126
Total	256
Completed during 1924:	
Forestry data	55
Cadastral cases	95
Total	150
Pending on December 31, 1924:	
Forestry data	75
Cadastral cases	31
Total	106

Special Maps—Continued.	
Land classification—Continued.	
Others completed during 1924:	
Forest contract of lease or special permit	1
For opposition against the registration	125
Showing vegetation in color	37
Copies in blue and maduro prints for field force and official uses (161 in maduro)	9,390
Sold to different entities (₱25.97)	12
Miscellaneous	11
Amount of blue print and maduro papers used during 1924:	
Blue print paper, 58 rolls of 50 yards by 42 inches (30,450 square feet)	₱957.00
Maduro paper, 13 rolls of 5, 10, and 15 yards by 36 inches (1,177.5 square feet)	48.30
Total cost	1,005.30

DIVISION OF LICENSES

This new division, which was formerly a section of the Division of Administration, was established on April 1, 1924, for the handling of all work attendant upon the issuing of licenses, special permits, caingins, and fire patrol.

The licenses issued under the provisions of the Forest Law entitle the holders thereof for certain fixed periods to enter upon definite tracts of public forest land and extract therefrom, under the conditions specified in the licenses, the forest products designated therein. These licenses are divided into the following general classes: license agreements, ordinary licenses, gratuitous licenses, miners' licenses, and special permits or leases.

The granting of licenses for the various kinds of forest products has been followed ever since the organization of this Bureau and has proven the simplest and most satisfactory method of disposal. With the exception of the license agreements, which usually are for a long period of time, licenses issued by this division are made to cover a period of not more than one year and are renewed yearly if the holders so desire and their operations have been satisfactory, providing that the local conditions so warrant. This method gives the Bureau better control over the licensees and enables it to close any areas which have been over cut or in which for reasons of conservation, water shed protection, etc., it is deemed best for the public welfare to close the area to occupation.

LUMBERING

Generally speaking, there has been marked progress in the operations and an increase in output during the year. This applies particularly to the sawmill operations and is due very largely to the increase in the export demand, especially from Japan.

PERSONNEL

Notwithstanding the great increase in the number of special permits, leases, etc. the office work of this division has been kept up-to-date. This has been done, however, at the expense of the inspection work to which it was planned at the beginning of the year to devote more time and attention.

At the close of the year there were on the roll of this division, 1 forester, 2 forest supervisors, 6 senior rangers, 73 rangers, 49 forest guards, and 12 clerks.

LICENSES ISSUED

During the year there were 1,965 ordinary timber licenses granted, or a decrease of 9 from the previous year. There was also a slight decrease in the number of ordinary minor product licenses issued during this year as compared with 1923; i. e., 2,674 as against 2,681, or a difference of 7 licenses.

The decrease in the number of ordinary licenses issued is due to the recent procedure adopted by the division of combining under one license the different areas granted to one licensee and to the policy of eliminating, as much as possible, those licensees who have obtained licenses for speculative purposes.

Of special licenses on the Friar Lands Estate the same number were issued this year as last, namely, 10.

There were 1,960 private gratuitous licenses issued in 1924, which is 763 less than were issued in 1923. This reduction is attributed very largely to the requirement of a license fee, which discouraged individuals who were uncertain whether they were going to build, from applying for a gratuitous license.

No tobacco curing house gratuitous licenses were issued, as the Legislature failed to extend the date of expiration of this law, which expired on December 31, 1923, and only 28 miners gratuitous licenses were issued, a decrease of 26 from 1923. This decrease is mostly due to suspension of development work.

During the year 362 applications for ordinary licenses were disapproved for various causes, and 656 applications for ordi-

nary and gratuitous licenses were held in abeyance pending receipt of the required bonds or license fees.

The adoption of the bonding system has very largely eliminated undesirable licensees and has greatly strengthened the Bureau's control over the operations of licensees. During the year bond deposits amounting to ₱21,792.02 were forfeited to the Government and ₱7,741.20 was refunded. The total amount of bond deposits on hand on December 31, 1924, is ₱158,800.44 and the total amount forfeited since the inauguration of the system is ₱35,934.13.

LICENSE FEES

The requirement of license fees for private and miner's gratuitous licenses was aimed directly at those licensees who in past years applied for new licenses year after year, without making any use of them. A secondary object was to compensate the Government for clerical hire, materials consumed, etc. From this source alone, the Government obtained ₱4,075.85 during the year, or a total of ₱5,023.75 since the requirement was inaugurated in 1923.

ASSESSMENT OF FOREST PRODUCTS

During the year an assessment was made on nipa sap and other forest products heretofore not assessed are being studied. So far, pandan, buri sap, and anahao leaves are under consideration for assessment.

SPECIAL PERMITS

The growing demand for the use of forest lands has made it necessary to amend the regulations promulgated under section 1838 of the Administrative Code so as to permit better control of the users of our forests and forest lands. The mandatory regulations contain among other things the proper assessment of rentals, the deposit of guarantee bonds and other lawful provisions governing the specific uses under which a given area may be put into use.

One of the important regulations recommended in the revised forest regulations is the provision authorizing the Director of Forestry to impose rental charges on persons occupying forest lands without the proper permit. It has been found that in many places there are number of persons squatting on forest land or using it for grazing and other purposes without permit from the proper authorities. In the absence of any express provision of the law, however, it was not possible to prosecute

them except under provisions of section 2751 of the Administrative Code. The administrative action proposed in the revised forest regulations, therefore, whereby the Director of Forestry is authorized to impose rental charges on persons who occupy forest lands without proper permit, seems the only solution of the problem and once approved, should be an effective means to check such illegal occupation.

The policy of the Bureau of Lands not to accept applications for homestead, lease or purchase in regions not yet certified as alienable and disposable by the Bureau of Forestry and the repeal of Act No. 2176 regulating the grazing in special provinces have contributed greatly to the tremendous increase during the past year, of applications for special permits or leases. The total number of applications filed with the Bureau this year is 3,087, as against 927 received in 1923. Of this number 1,967 applications are for special residence or private camps, 415 for pasture, 253 for fish ponds and salt works and 16 for special uses. Four hundred and thirty-six applications were also received directly by forest officers which have not yet been recorded by the Manila Office.

The Bureau's collections of rentals for 1924 from the various kinds of special permits totalled ₱14,626.52 as against ₱6,576.02 for the previous year, an excellent showing and is indicative of what may be expected in the future from this source of revenue.

CAIÑGIN PERMITS

The applications for caiñgin permits received during the year reached a total of 2,386 as compared with 3,723 for 1923, and there were cleared 4,697 hectares of public forest land, as against 7,850 cleared in 1923. The decrease indicated above is mainly due to the substitution of special use permits and to the policy of issuing caiñgin permits only in cases of public calamity.

ILLEGAL CAIÑGINS

The same policy and procedure was followed this year as last, except that in the case of complaints involving more than ₱200, the consent of the fiscal to file direct with the justice of the peace, was first obtained.

There have been detected during this year 1,753 illegal caiñgins as against 1,759 reported in 1923. The total amount of forest products destroyed is 99,455.97 cubic meters, representing a lose to the Government of ₱153,921.54.

Of the total number reported this year, 1,218 had been acted upon, resulting in 384 convictions and 49 acquittals, while the sum of ₱1,876.73 was collected as forest charges from 75 *caiñgineros*.

GAME AND FISH

Owing to lack of personnel, very little patrol work has been done during the year to enforce the game and fish laws. The census of game and fish, started in 1923, was compiled from the reports of the officers in charge of stations, but the reports were received too late to include in the 1923 Annual Report and as the data submitted was by no means complete, it has been decided not to tabulate it until more complete statistics have been obtained.

A regulation has now been inserted in all licenses and permits issued by this Bureau whereby the holders thereof are required to report to the nearest Constabulary or forest officer any violations of the Game and Fish Laws coming under their observation.

Blue print copies of a chart, 10 × 14 inches also have been prepared, for distribution to the various forest stations, showing the different open and close seasons for the hunting of game birds and animals.

ADMINISTRATIVE DIVISION

GENERAL STATEMENT

The Administrative Division of this Bureau has under its supervision and control the following sections, besides having direct supervision over all clerical work of the Bureau:

Accounting, Property, Records, Library and Translating, General Service Sections, and district clerks.

The extent of the entire work of this division have been fully detailed in previous reports of the undersigned.

ACCOUNTING SECTION

This section has for its main duties the keeping of accounts of funds assigned to this Bureau, the disbursement of same for salaries, traveling expenses, miscellaneous accounts as well as the collection of such accounts due this Bureau. It has, during the year, and within the limit of the appropriation of the Bureau of Forestry, paid ₱395,769.76 for salaries and wages and ₱144,561.81 for traveling and other miscellaneous expenses. On account of the limited appropriation of the Bureau, not

commensurate with the increasing field force as a result of the employment of 23 new rangers who were under contract to work in the Bureau, due to the fact that no provision has been allowed in the appropriation for the year for such necessities resultant from their employment so on October 22, 1924, the amount of ₱10,023 from the savings on salaries was transferred by the Emergency Board as per our request to the different items under the miscellaneous expenses in the appropriation of this Bureau. This was done as otherwise the work and activities of this Bureau in the field had to be stopped on or about November 1 to avoid overdraft at the end of the year.

Another fact which requires serious consideration is the granting of bigger appropriation for house rent and labor. There have been numerous requests received from our field men for the increase of allowances for house rent and for the employment of janitors in the forest stations, but due to lack of funds, very few, if any of such requests, were entertained. This condition of the provincial stations of this Bureau must not be allowed to continue. It is, therefore, of interest to note that unless the appropriation requested for these two particular items is given, it will work a hardship on the part of this Bureau. To cite a specific instance, there are places in the provinces where forest officers renting houses for forest stations were compelled to bear the burden of paying part of the rents when the Bureau allowances cannot fully cover up the rents of the houses fair enough for forest stations. This Bureau must not allow its forest officers spend from their own money expenses that should be met by the Government. Also, in some forest stations, especially in the district headquarters, the necessity of employing janitor to clean the office quarters is indispensable, but as the funds for this purpose do not permit, the forest officers themselves have to do the cleaning of the office, or else, hire laborers at their own expense.

In addition to the regular Bureau transaction mentioned above, the Accounting Section also does the following work:

FOREST PENSIONADOS

The salaries and traveling expenses of the pensionados of the School of Forestry, Los Baños College, University of the Philippines, were paid directly by this Bureau who in turn gets the reimbursement of same from the University of the Philippines. This is done on account of the connection of the Bureau

of Forestry with the School of Forestry, University of the Philippines.

FIDUCIARY FUND, CONCESSION GUARD TRUST FUND DEPOSITS

There were 15 lumber companies which made a total deposit with this Bureau during the year in the amount of ₱10,344.56 for the payment of the salaries of the concession guards who work in their cutting areas under the direct supervision of the Bureau of Forestry. This is required due to the nature of their lumber operations and for these companies to have a constant protection in their cutting areas from unlicensed timber cutters.

FIDUCIARY FUND—LICENSE BOND DEPOSITS

There is held in trust with this Office, as shown in our books, during the year, a total license bond deposit in the amount of ₱188,270.66. Of this amount, ₱7,741.20 was refunded, and ₱21,729.02 forfeited. The work of keeping the license bond deposits properly and up-to-date requires no little time, as warrants have to be drawn every time the bond of individual depositors is refunded or forfeited. In case of transfer of bond from one licensee to another, as is generally the case, journal vouchers were prepared.

PROPERTY SECTION

SUPPLIES

The appropriation for 1924 authorizes the amount of ₱32,300 for the purchase and consumption of supplies and materials. This amount, however, was exhausted about the latter part of September and it was necessary to request for an additional amount of about ₱2,200 so that supplies absolutely needed could be secured to continue the operations of the office during the remaining part of the year. On account of the limited amount granted, this Office had to disapprove a number of requisitions of our field men which in many cases resulted in the detriment of the service. The original estimate for the Bureau of Forestry for 1924, contained a request for a larger amount than that authorized by the Legislature in 1923, because of the increased personnel, work and other activities of the Bureau, but it had not been able to secure the desired additional amount.

EQUIPMENT

There was requested during the year the amount of ₱7,466.69 of which only ₱6,319.95 was approved by the Emergency Board for the purchase of office and scientific equipment. A number

of items thus requisitioned were disapproved on the ground that they were not absolutely necessary, although the different requisitions were substantiated with complete explanations regarding their imperative necessity. The effect of lack of equipment is obvious.

REQUISITIONS

The records of this section show that there were received 1,482 requisitions from Manila and field personnel. These requisitions were filled promptly with such supplies and equipment available in stock. All issues were covered by issue vouchers numbering 2,730, the originals of which, properly classified in consonance with the use of supplies, were all submitted to the Insular Auditor, for verification and approval.

There were filed with the Bureau of Supply requisitions totalling 123; with the Bureau of Printing 131, and with local firms, for direct purchases, 80.

In view of the frequent fluctuations in prices of supplies during the past years, the provincial personnel of this Bureau were asked to submit their requisitions in small quantities, this practice, however, is proposed to be discontinued and ask them instead to submit requisitions for supplies for three months or more in order to avoid shortage in the future, and to prevent much overwork in the Property Section resulting from the preparation of emergency requisitions.

MEMORANDUM RECEIPTS

From January 1 to December 31, 1924, Memorandum Receipts (General Form 32–A) totalling 443 were prepared and posted in the property ledger. Reliefs, 225 in number, covering the return of equipment to Manila were issued.

During the year there have been transferred to the Bureau of Forestry second hand equipment from different offices valued at ₱2,017.45. The total cost of property dropped on account of sale, condemnation, and loss is ₱749.61.

SHIPMENT AND REPAIRS

During the year there were received from provincial stations 108 shipments. The central office dispatched 307 mostly containing supplies needed by provincial forest stations, land classification parties, etc.

This Office paid the amount of ₱1,945 during the year for repair work done on assorted equipment of this Bureau. Some of the equipment repaired were in second hand condition when transferred to this Bureau.

SCHOOL OF FORESTRY PROPERTY

All orders for supplies and equipment for the school of Forestry to the University of the Philippines are handled in this section because of the fact that the Director of Forestry is ex-officio Dean of the School of Forestry of the University of the Philippines.

RECORD SECTION

This section is in charge of all the general records of this Bureau including the distribution of publications, the preparation of personnel lists, the registration of appointment, resignations, applications for leave, etc. All mimeograph work of this Bureau is also handled in this section.

In view of the increased personnel and activities of this Bureau, the work in this Section has increased greatly during the year.

Mails sent by this Office:	
Registered letters and packages	1,841
Letters sent by ordinary mail including packages, licenses, circulars, forms, and other printed matters	137,672
Telegrams sent by this Bureau	508
Letters delivered by messengers to different Government offices and other parties	11,447
Total	151,468
Mails received in this Office:	
Registered letters	5,687
Registered packages	131
Letters	39,017
Reports, working programs, expense accounts, bills, etc	37,795
Telegrams	797
Printed matter received by ordinary mail	1,472
Total	84,899
Publications sent out by this Office:	
Number of publications sold by this Bureau during the year	101
Number of publications sent to parties (public libraries, Bureaus, foreign forest services, Universities, scientific institutions, scientists, etc.) during the year	876
Total	977

MESSENGER SERVICE

The number of messengers allowed for the Bureau has not been increased during the year hence the three messengers available are being overworked. Request for the increase of their number has already been made on several occasions.

LIBRARY AND TRANSLATING SECTION

As in previous years, the library of this Bureau has been a source of information to lumbermen, the public in general, and in a great measure to students of different public and private schools. In fact, it has been noted with pleasure that the teachings of forestry and the conservation of natural resources is becoming more and more widespread in our schools.

Forestry and other scientific publications from almost all the progressive countries of the world are received and properly catalogued and filed in the library for ready reference.

All cuts appearing in the publications of this Bureau are properly recorded and filed for future use. Photographs of forestry activities are likewise filed in the library.

A scrap book is also kept in which all such articles in the local and foreign press referring to the activities or the personnel of the Bureau are conserved.

This section is also in charge of the files of public laws, executive orders, proclamations, etc., furnished this Bureau as well as of such copies of bills presented to the Legislature referring directly or indirectly to forestry matters.

In addition to the work ordinarily attached to a library, this section is also in charge of all translations for the Bureau from English to Spanish or local dialects and vice versa.

The actual number of books, pamphlets, and periodicals existing in the library of the Bureau of Forestry are as follows:

Number of bound volumes	570
Number of unbound volumes	97
Number of pamphlets	2,973
Subscription to periodicals	20

RECOMMENDATIONS

Attention is invited to the following recommendations, many of which due to their importance are reiterations of those made in previous annual reports:

1. That a fund be appropriated for the necessary work in land classification, delimination and survey by the Bureaus of Lands and Forestry for a definite period of years, the expenditures of which to be controlled and directed by a committee so authorized. This work is the most important of any now confronting the two Bureaus above mentioned and cannot be carried out efficiently or expeditiously if they are compelled to depend exclusively upon their ordinary appropriation.

2. That funds be appropriated for the addition to the Bureau building. At present the congestion of the work of all the sections, with respect to filing and recording, is such that it is becoming practically impossible to attend to them. Furthermore, due to the rapid increase of the work being performed by the land classification parties, it soon will be impossible to work up all the field notes and data in the space now allotted to the Mapping Section.

3. That the salaries of the personnel of the Bureau be placed on the same basis as required in the standardization plan for personnel of the same or equivalent technical training.

4. That the personnel handling the policy and administration work be increased sufficiently to adequately handle it properly and that a permanent corps of forest guards of at least third-grade civil service rating be allowed. At least fifty additional guards should be employed to protect the forests under present conditions. This will be a distinct economy as the rangers will be relieved of much patrol work enabling them to devote the time thus saved to land classification and other special projects.

5. That section 1838 of the Administrative Code, regulating the maximum areas to be leased for fish ponds, pastures, and sawmill sites, be changed to read as follows: "For fish ponds, up to 200 hectares, for pasture up to 1,024 hectares, and not to exceed 25 hectares for every sawmill site or lumber yard as may be required in the development of a license area."

6. That the limitation of 10 hectares as the maximum area which can be granted by the Bureau of Forestry under permit, be increased to cover 24 hectares. This should be done to protect the Bureau's permittees, who now occupy unclassified public lands in the expectation of applying for this land as soon as it is classified and thrown open to settlement.

7. That an increase of four forest surveyors and four draftsmen be provided to take care of the increasing volume of work due to land classification.

8. That the guard-scalers be placed in the classified civil service with the same footing at least as the second grade eligibles. This should be done to place the grading personnel on a permanent basis and to give the Bureau a hold on the men employed in this work. Under the present temporary basis, guard-scalers, as soon as they become proficient, frequently resign with only 24 hours notice and accept work of the same nature with private concerns at a much higher remuneration.

9. That funds be made available to enable this Bureau to make arrangements for the training of ranger-scalers in lumber grading, in those places where expert lumber inspectors are employed. This work is imperative, as the demand for expert lumber graders has increased so rapidly, that this Bureau has been practically stripped of the personnel specially trained in this work.

10. A law should be passed punishing illegal occupation of public forests, giving the Bureau the right of ejection.

11. The penalty for the destruction of public forests should be increased and the violators should be compelled to reimburse the Government for the full amount of the damage done.

12. The penalties for evading the payment of forest charges should be made at least quadruple for a second and subsequent offenses. At present they are only double the regular charges.

13. That a special fund be appropriated similar to the Talisay–Minglanilla reforestation fund of at least ₱40,000 per annum, to be expended annually on systematic reforestation on a large scale.

14. The legislation affecting communal forests be changed to give them the status of forest reserves.

15. That adequate provision for an increase in the teaching staff and equipment of the School of Forestry be recommended to the Board of Regents of the University of the Philippines and that they appropriate funds for an additional building for instruction purposes, more student and faculty cottages and a small truck for hauling supplies.

16. That a graduate ranger who has shown proficiency in Dendrology be sent to the United States to specialize in Dendrology and Taxonomy. The loss of Doctor Merrill from the Bureau of Science necessitates having a specially trained man to take care of the identification of Botanical materials handled by the Bureau.

17. That funds be provided for the establishment of a forest products laboratory for the Division of Investigation and for at least six experiment stations in various parts of the Islands.

Respectfully submitted,

Arthur F. Fischer

Director of Forestry

The Honorable
The SECRETARY OF AGRICULTURE AND NATURAL RESOURCES
Manila.

DIRECTORY OF THE BUREAU OF FORESTRY

ARTHUR F. FISCHER, *Director*

DIVISION OF FOREST MANAGEMENT

Arthur F. Fischer, Director	Acting chief
Fernando L. Amarillas	Ranger.
Emilio D. Parreño	Forest guard.
Toribio de la Cruz	Junior stenographer.

LICENSES DIVISION

Ramon J. Alvarez	Forester, chief.
Gregorio Elumir	Ranger.
Melecio Lopez	Ranger.
Ignacio Cauagas	Ranger.
Luis G. Geronimo	Forest guard.
Aquino R. Leaño	Forest guard.
Dimas Abejero	Forest guard.
Leon Reboredo	Forest guard.
Alfonso Salvoza	Forest guard.

SPECIAL PERMIT SECTION

Eladio C. Leaño	Forest supervisor, chief.
Silvino Reyes	Ranger.
Francisco Abijay	Ranger.
Urbano Eblacas	Forest guard.
Fausto Pe Benito	Clerk.
Benigno Ongcoy	Clerk.

STATISTICAL SECTION

Felix Mabbayag	Ranger, chief.
Petronilo Cortes	Ranger.
Ricardo Arafiles	Ranger.
Gregorio Orillo	Ranger.
Cenon Bulacan	Forest guard.
Ricardo M. Chinjen	Forest guard.

ISSUE SECTION

Eufenio Santillan	Chief.
Luis S. Mabagos	Clerk.
Francisco de Asis	Clerk.
Claro L. Camba	Clerk.
Eligio Cordero	Clerk.
Pastor B. Fabunan	Clerk.
Eugenio Mendoza	Clerk.
Jose M. Noche	Clerk.
Emilio Ynabañgan	Clerk.
Pedro R. Mañago	Clerk.

FOREST DISTRICT OF NORTHERN LUZON

[Headquarters: Vigan, Ilocos Sur. Administrative Districts 1 and 2]

District forester: NAZARIO PEÑAS

DISTRICT No. 1

[Provinces: Cagayan, Isabela, Mountain Province (Apayao and Kalinga, Subprovinces of), and Batanes]

Forest Station at Aparri, Cagayan (district headquarters):

Pastor de la Peña	Officer in charge.
Hermenegildo Bautista	Ranger.
Leonor Lizardo	Ranger.
Antonio Aloba	Forest guard.
Ambrosio Perez	Clerk.

Forest Station at Ilagan, Isabela:

Francisco Siriban	Officer in charge.

Forest Station at Alcala, Cagayan:

Mamerto C. Azurin	Officer in charge.

Forest Station at Echague, Isabela:

Vicente Parras	Officer in charge.
Deogracias Guzman	Ranger.

Forest Station at Claveria, Cagayan:

Jose Makil	Officer in charge.
Marcelo Fonacier	Forest guard.

DISTRICT No. 2

[Provinces: Ilocos Norte, Ilocos Sur, and Abra]

Forest Station at Vigan, Ilocos Sur (district headquarters):

Espiritu Paraiso	Officer in charge.
Pedro Valentin	Ranger.
Gregorio F. Navarro	Forest guard.
Juan Balbuena	Forest guard.

Forest Station at Bangued, Abra:

Cayetano Barros	Officer in charge.

FOREST DISTRICT OF NORTH CENTRAL LUZON

[Headquarters: Baguio, Mountain Province, Administrative District 3]

District forester: FELIX FRANCO

DISTRICT No. 3

[Provinces: Mountain Province (Benguet, Bontoc, Amburayan, and Lepanto), and La Union (northern part)]

Forest Station at Baguio, Bontoc Province (district headquarters):

Robert P. Cortes	Ranger.
Saquiapao Willie	Ranger.
Pioquinto de la Vega	Ranger.

Forest Station at Baguio, Bontoc Province (district headquarters)—Cont.

Pastor Gracia	Forest guard.
Godofredo Costales	Forest guard.
Esteban Fontanilla	Forest guard.
Francisco Abubo	Forest guard.
Pedro Gacad	Forest guard.
Aquilino Balbin	Forest guard.
Timoteo Lagasca	Forest guard.
Mariano Fontanos	Forest guard.
Simon Briones	Forest guard.

FOREST DISTRICT OF CENTRAL LUZON

[Headquarters: Manila, Administrative Districts 4, 9, and 11]

District forester: ANTONIO P. RACELIS

DISTRICT No. 4

[Provinces: Pangasinan, Nueva Ecija, Nueva Vizcaya, Tarlac, and La Union (southern part)]

Forest Station at Dagupan, Pangasinan (district headquarters):

Isabelo Achacoso	Officer in charge.
Pantaleon J. Santos	Ranger.
Gervasio Rarang	Ranger.
Canuto Ducusin	Forest guard.
Victorino Mariano	Forest guard.
Irineo Lopez	Clerk.

Forest Station at San Quintin, Pangasinan:

Juan Acenas	Officer in charge.
Perfecto Adamos	Ranger.
Anselmo Agustin	Forest guard.

Forest Station at Bayombong, Nueva Vizcaya:

Pedro Afalla	Officer in charge.

DISTRICT No. 9

[Province: Palawan]

Forest Station at Puerto Princesa, Palawan (district headquarters):

Mauro Ablaza	Officer in charge.
Cornelio Miguel	Ranger.

Forest Station at Balabac, Palawan:

Pedro Agaloos	Officer in charge.

Forest Station at Oton, Taytay, Palawan:

Benito L. Roque	Officer in charge.

DISTRICT No. 11

[Provinces: Cavite, Rizal, Pampanga, Bataan, Bulacan, and Zambales]

Forest Station at Manila (district headquarters):

Clemente Mariano	Officer in charge.
Vicente J. Defensor	Ranger.

Forest Station at Manila (district headquarters)—Continued.

Primitivo Baluyot	Forest guard.
Emilio Fabila	Forest guard.
Gaudencio Ramirez	Clerk.

Forest Station at Arayat, Pampanga:

Ambrosio Galisim	Officer in charge.
Hilario Borromeo	Forest guard.

Forest Station at Limay, Bataan:

Vicente J. Villaflor	Officer in charge.
Teodoro Mgalindan	Forest guard (almacen)
Carlos Villaruel	Forest guard.

Forest Station at Subic, Zambales:

Fausto Alambra	Officer in charge.
Marcial Agayan	Forest guard.

Forest Station at Masinloc, Zambales:

Marcelo Udarbe	Officer in charge.
Deogracias F. Agustin	Forest guard.

Forest Station at Paysawan, Bagac, Bataan:

Gerardo B. Tamayo	Officer in charge.
Conrado Tongco	Ranger.
Severino Ta-ay	Forest guard.
Cipriano Deoferio	Forest guard.

Forest Station at Norzagaray, Bulacan:

Andres Bernardo	Officer in charge.
Cipriano Domingo	Forest guard.

FOREST DISTRICT OF SOUTH CENTRAL LUZON

[Headquarters: Los Baños, Laguna, Administrative Districts 5 and 12]

District forester: PLACIDO DACANAY

DISTRICT No. 5

[Provinces: Batangas, Tayabas, Laguna, and Marinduque]

Forest Station at Los Baños, Laguna (district headquarters):

Severo Oliveros	Officer in charge.
Francisco L. Rola	Ranger.
Mariano Cenabre	Forest guard.
Eusebio I. Villanueva	Forest guard.
Eladio Mañgapit	Forest guard.

Forest Station at Calauag, Tayabas:

Luis Aguilar	Officer in charge.
Luis Batica	Ranger.
Felix Dayao	Forest guard.
Marciano R. Victoria	Forest guard.

Forest Station at Infanta, Tayabas:

Leonardo F. Granada	Officer in charge.
Juan M. America	Forest guard.

Forest Station at Laguimanoc, Tayabas:

Alberto Villanueva	Officer in charge.
Leopoldo Miciano	Forest guard.
Magno Hornedo	Forest guard.
Moises Montalbo	Forest guard.

Forest Station at Mauban, Tayabas:

Crispino Tansioco	Officer in charge.

Forest Station Kabibihan, via Aloneros, Tayabas:

Gregorio Miras	Officer in charge.
Alfredo Dumlao	Ranger.
Cayetano Gamalinda	Forest guard.

DISTRICT No. 12

[Province: Mindoro]

Forest Station at Calapan, Mindoro (district headquarters):

Cornelio Nable Jose	Officer in charge.
Eusebio Leuterio	Ranger.
Fabian Antonio	Ranger.

Forest Station at San Jose, Mindoro:

Pedro P. Lasquety	Officer in charge.
Rufo Burnea	Forest guard.

FOREST DISTRICT OF SOUTHERN LUZON

[Headquarters: Legaspi, Albay. Administrative District 6]

Officer in charge: PORFIRIO SAN BUENAVENTURA

DISTRICT No. 6

[Provinces: Albay, Camarines Sur, Camarines Norte, Catanduanes, and Sorsogon]

Forest Station at Naga, Camarines Sur (district headquarters):

Porfirio San Buenaventura	Officer in charge.
Ramon Mataya	Ranger.
Gregorio J. Labitag	Ranger.
Inocencio Ramirez	Ranger.
Martin Guerrero	Ranger.
Eulogio Gines	Forest guard.
Fermin Sol	Forest guard.
Agapito M. Borja	Forest guard.

Forest Station at Mercedes, Camarines Norte:

Gregorio Arizabal	Officer in charge.
Sebastian Borja	Forest guard.

Forest Station at Sorsogon, Sorsogon:

Jose G. Pacis	Officer in charge.
Jorge Miranda	Ranger.
Alejandro Eguarras	Forest guard.

Forest Station at Catabañgan, Tayabas:

Macario Simeon	Officer in charge.
Justiniano G. Vela	Forest guard.
Pedro Iglea	Forest guard.

Forest Station at Virac, Albay:

Filemon Kapuno	Officer in charge.
Pedro Aduviso	Ranger.

Forest Station at Legaspi, Albay:

Jesus O. Duran	Officer in charge.
Sabas Sabado	Ranger.

FOREST DISTRICT OF ORIENTAL VISAYAS

[Headquarters: Tacloban, Leyte. Administrative District 10]

District forester: SIXTO LARAYA

DISTRICT No. 10

[Provinces: Leyte (eastern half), Samar, Surigao, and Masbate]

Forest Station at Tacloban, Leyte (district headquarters):

Adriano V. Santos	Officer in charge.
Agustin P. Angeles	Ranger.
Lorenzo Diaz	Ranger.
Perfecto Tomeldan	Ranger.
Jose Sydiongco	Forest guard.
Procopio Baltazar	Forest guard.
Emilio B. Lago	Forest guard.

Forest Station at Catbalogan, Samar:

Florentino C. Versoza	Officer in charge.
Adriano M. Valdez	Ranger.
Cirilo Inciso	Forest guard.

Forest Station at Laoang, Samar:

Emeterio Edmilao	Officer in charge.
Pelagio Alemania	Forest guard.

Forest Station at Masbate, Masbate:

Numeriano Valencia	Officer in charge.
Gabriel Guillen	Ranger.
Valeriano Columna	Forest guard.

Forest Station at Surigao, Surigao:

Leon Rojas	Officer in charge.
Simon Montero	Ranger.

FOREST DISTRICT OF OCCIDENTAL VISAYAS

[Headquarters: Cadiz, Occidental Negros, Administrative Districts 7 and 13]

District forester: FELIPE R. AMOS

DISTRICT No. 7

[Provinces: Antique, Capiz, Iloilo, Negros Occidental, and Romblon]

Forest Station at Cadiz, Occidental Negros (district headquarters):

Aquilino Contreras	Acting officer in charge.
Pedro Gimeno	Ranger.
Aquilino Porciuncula	Ranger.
Roman Amor	Ranger.
Gregorio Poblacion	Ranger.
Miguel Eugenio	Ranger.
Constantino Rabaya	Ranger.
Teodoro Oliveros	Forest guard.
Mansueto Olaira	Forest guard.
Arcenio B. de los Reyes	Forest guard.
Joaquin Herman	Forest guard.
Policarpo Santos	Clerk.

Forest Station at Asia, Occidental Negros:

Andres Masias	Officer in charge.

Forest Station at Ilog, Occidental Negros:

Maximino Rondario	Officer in charge.

Forest Station at Fabrica, Occidental Negros:

Florencio M. Songco	Officer in charge.
Juan S. Versoza	Ranger.
Fausto Flores	Ranger.
Balbino Viado	Ranger.
Valentin Semilla	Ranger.
Francisco Diaz	Forest guard.
Ambrosio Canilao	Forest guard.
Fausto Ejercito	Forest guard.
Bernardo Villar	Forest guard.
Igmidio Magluyan	Forest guard.
P. Londres Zambales	Forest guard.

Forest Station at New Washington, Capiz:

Simplicio Aguilar	Officer in charge.
Geronimo Tabamo	Ranger.
Daniel Espinosa	Forest guard.

District No. 13

[Provinces: Cebu, Oriental Negros, Misamis, Bukidnon, Lanao, Agusan, Leyte (western half) and Bohol]

Forest Station at Cebu, Cebu (district headquarters):

Severo S. Ponce	Officer in charge.
Maximo Oro	Ranger.

Forest Station at Cebu, Cebu (district headquarters)—Continued

Marcelino Genove	Ranger.
Miguel Pato	Ranger.
Vicente de la Cruz	Ranger.
Venancio N. Fernandez	Forest guard.
Lucas Cabinas (Talisay)	Forest guard (Div. Inv.).

Forest Station at Dumaguete, Oriental Negros:

Jose Flores	Officer in charge.

Forest Station at Butuan, Agusan:

Angel Mallonga	Officer in charge.
Manuel F. Cordero	Forest guard.

Forest Station at Kolambugan, Lanao:

Bernardo Tocmo	Officer in charge.
Lucio Abalos	Ranger.
Faustino A. Guerrero	Ranger.
Venancio Tenerrife	Forest guard.

Forest Station at Dipolog, Zamboanga:

Juan Oblina	Officer in charge.
Gregorio Quezon	Forest guard.

Forest Station at Cagayan, Misamis:

Timoteo Quimpo	Officer in charge.

FOREST DISTRICT OF MINDANAO AND SULU

[Headquarters: Zamboanga, Zamboanga. Administrative District 8]

District forester: ROY F. WENDOVER

[Provinces: Zamboanga (except northern part), Sulu, Cotabato and Davao]

Forest Station at Zamboanga, Zamboanga (district headquarters):

Celestino Gomez	Officer in charge.
Prudencio Florita	Ranger.
Quirino Ruiz	Ranger.
Teodoro Tecson	Ranger.
Norberto Denoga	Ranger (Punta Flecha).
Clemente Colinares	Ranger.
Emilio Bañes	Ranger.
Jose F. Nano	Forest supervisor.
Isabelo V. Ostrea	Forest guard (Port Holland, Zamboanga).
Pedro Miguel	Forest guard (Panabutan Bay).
Manuel San Luis	Forest guard.
Julio Brillantes	Clerk.

Forest Station at Cotabato, Cotabato:

Florencio Asiddao	Officer in charge.
Cayetano Macaraeg	Ranger (Port Lebak, Cotobato).

Forest Station at Cotabato, Cotabato—Continued.

Cecilio Rola	Ranger.
Juan Viscayno	Forest guard (Milbuk, Cotabato).

Forest Station at Naga-Naga, Zamboanga:

Santiago Babaran	Officer in charge.
Gregorio L. Dagang	Ranger (Lumarao).
Zoilo A. Sambrano	Ranger.
Nicolas O. Luna	Forest guard (Olutanga)

Forest Station at Port Banga, Zamboanga:

Carlos Coronel	Forest guard.

Forest Station at Davao, Davao:

Sixto Babao	Officer in charge.
Tomas Raboy	Ranger.

Forest Station at Mati, Davao:

Juan C. Andrada	Officer in charge.

Forest Station at Jolo, Sulu:

Juan Corales	Officer in charge.

Forest Station at Margosatubig, Zamboanga:

Bonifacio Perez	Officer in charge.
Roman Guerrero	Forest guard.

DIVISION OF FOREST LANDS AND MAPS

Rafael Medina	Forester, chief.
Cecilio Maneja	Forest supervisor.
Doroteo Soriano	Forest surveyor.
Vicente Castillo	Senior ranger.
Aniano David	Ranger.
Norberto Soloria	Ranger.
Leoncio A. de la Cruz	Ranger.
Magdaleno Tugade	Ranger.
Joaquin Estrada	Ranger.
Juan Fontanoza	Ranger.
Celso Medrano	Ranger.
Antonio Quiaoit	Ranger.
Gregorio Zamuco	Ranger.
Rafael San Pedro	Ranger.
Hermenegildo Alviar	Ranger.
Atanasio B. Catambay	Ranger.
Buenaventura Brillantes	Ranger.
Eulogio Dres	Ranger.
Aniceto Sulit	Ranger.
Ambrosio Bitonio	Ranger.
Primitivo de la Vega	Ranger.
Carlos Guerrero	Ranger.
Pio Salomon	Ranger.

DIVISION OF FOREST LANDS AND MAPS—Continued.

Juan Pacheco	Ranger.
Pablo Umadhay	Ranger.
Rafael Quidilla	Ranger.
Ramon Acuña	Ranger.
Quintin Gellidon	Ranger.
Felix Jucaban	Ranger.
Daniel B. Allas	Ranger.
Ptolomeo Causing	Ranger.
Braulio Cristobal	Ranger.
Raymundo Daza	Ranger.
Mariano Galenzoga	Ranger.
Pedro Gañgan	Ranger.
Castor Jundak	Ranger.
Lorenzo Logan	Ranger.
Edilberto Madrid	Ranger.
Manuel Malana	Ranger.
Pedro Montero	Ranger.
Domingo P. Ramel	Ranger.
Angel Salazar	Ranger.
Calixto Santos	Ranger.
Jose Seneca	Ranger.
Manuel Tupas	Ranger.
Melencio Yutuc	Ranger.
Ambrosio Damo	Ranger.
Juan Acojido	Junior stenographer.
Edilberto Barot	Clerk.
Lorenzo Sison	Clerk.
Lucas Cruz	Clerk.
Osmundo Ponce	Clerk.

DRAFTING SECTION

Cornelio Samaniego	Draftsman, chief.
Gregorio Vicencio	Draftsman.
Hermogenes Reyes	Draftsman.
Agaton Villafuerte	Draftsman.
Marcelino Cruz	Draftsman.
Sebastian Domingo	Draftsman.
Cayetano Crisostomo	Draftsman.
Wenceslao Moje	Draftsman.
Alberto Gutierrez	Draftsman.
Jose A. Domingo	Draftsman.
Pedro Caluag	Draftsman.
Tomas Monar	Draftsman.
Hilario Trajano	Draftsman.

DIVISION OF SAWMILLS AND UTILIZATION

William Crosby	Forester, chief.
Florencio Tamesis	Forester.
Luis J. Reyes	Forester.

DIVISION OF SAWMILLS AND UTILIZATION—Continued

Alberto Barros	Ranger.
Enrique Alviar	Ranger.
Doroteo Antonio	Ranger.
Justo M. Pascual	Ranger.
Pablo Roque	Forest guard.
Sinforoso Apacible	Forest guard.
Antonio Cuenco	Forest guard.
Apolinario Marquez	Forest guard.
Doroteo Abella	Clerk.
Pedro Pineda	Clerk.
Anacleto Ea	Clerk.

ADMINISTRATIVE DIVISION

Vicente C. Ramos	Chief clerk.
Sulpicio Olimpo	Clerk.
Aurea Villaruz (Miss)	Junior stenographer.

ACCOUNTING SECTION

Eugenio Tadle	Clerk.
Melchor Enriquez	Clerk.
Aguedo Castro	Clerk.
Deogracias Antonio	Clerk.
Arcadio Gepiga	Clerk.
Felipe Reyes	Clerk.
Arsenio Protacio	Clerk.
Francisco Villa	Clerk.
Crescencio Jimeno	Clerk.

PROPERTY SECTION

Cirilo Asperilla	Property clerk.
Pablo D. Villena	Clerk.
Venancio Babida	Clerk.
Santiago Laya	Clerk.
Froilan Rosqueta	Clerk.
Amando Adriano	Clerk.
Demetrio Saluñga	Clerk.
Mariano Ocampo	Clerk.

RECORDS SECTION

Enrique Baña	Chief.
Aquilino C. Bartolome	Clerk.
Jose Salvador	Clerk.
Juan G. Loteyro	Clerk.
Laureano Navasca	Clerk.
Angel Esguerra	Clerk.
Quintin Ortega	Clerk.

LIBRARY AND STATISTICAL SECTION

Simplicio Beltran	Chief.

GENERAL SERVICE SECTION

Apolonio Reynera	Messenger.
Geronimo Roque	Messenger.
Pantaleon Casilag	Messenger.
Bartolome Estacio	Porter.
Severino Esguerra	Watchman.
Epitacio Oblepias	Watchman.
Fernando Rañada	Janitor.
Pastor Ramos	Janitor.
Benito Zambales	Janitor.
Claudio Cabaylo	Janitor.
Agustin Lagan	Janitor.

DIVISION OF INVESTIGATION

Otto W. Pflueger	Forester, chief.
Harold Cuzner	Technical Employee.
Luis R. Salvosa	Forester.
Agapito L. Cenabre	Forest supervisor.
Macario A. Mariano	Forest supervisor.
Alejandro de Mesa	Forest supervisor.
Juan Lopez	Forest supervisor.
Carlos Sulit	Forest supervisor.
Tomas N. Roque	Senior ranger.
Felipe Salvoza	Ranger.
Justino Seguerra	Ranger.
Mamerto D. Sulit	Ranger.
Andres Lemos	Ranger.
Teodoro Delizo	Ranger.
Evaristo Tabat	Ranger.
Nicolas Angeles	Nurseryman.
Florentino Canicosa	Nurseryman.
Maximo Pañga	Nurseryman.
Julian Revelleza	Nurseryman.
Antonio Banacijan	Nurseryman.
Estanislao Caracuel	Nurseryman.
Valentin Patame	Forest guard.
Alejandro Alcantara	Forest guard.
Sotero Manzanilla	Forest guard.
Braulio P. Flores	Forest guard.
Felix Columbres	Forest guard.
Nemesio Aspiras	Forest guard.
Casimiro Aspiras	Forest guard.
Timoteo Gutang	Forest guard.
Agustin Cardines	Clerk.

STATISTICAL TABLES

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value*

Province	Received from the Bureau of Lands												Certified to the Bureau of Lands—Agriculture					
	Pending from previous year						During the year 1924											
	A. C.	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total
Abra								47	2			49		22				22
Agusan		37	2	1		40		25				25		23				23
Albay		19	1		1	21		7	2	1		10		5	1			6
Antique		4			7	11		140		1		141		14			7	21
Bataan		11	1		3	15		175	6	5		186		59	2	1	2	64
Batanes		1				1		1				1						
Batangas																		
Bohol								123		6		129						
Bukidnon		19	2	4		25		35				35		23	1	2		26
Bulacan								48	1	1		50		28		1		29
Cagayan		33	2	1	1	37								16	1		1	18
Camarines Norte		21	2		3	26		178	10			188		44	5		2	51
Camarines Sur		6			38	44		602	4	2		608		250	3		32	285
Capiz		17				17		83		2		85		40				40
Cavite									1			1						
Cebu		9	3	1		13		42	1	2		45		5				5
Cotabato		123	7	11	2	143		263	4	2		269		333	10	6	2	351
Davao		477	3	2	9	491		424	14	3		441		256	8	3	9	276
Ilocos Norte		1			46	47		17	2	2		21		9	1		7	17
Ilocos Sur		2	1		1	4		149	1			150		43	1			44
Iloilo		2	1		1	4		94				94		35	1	1		37
Isabela		20	3		1	24								2			1	3
Laguna		1	1	1	2	5		40				40		7		1	2	10
Lanao		39	5	1	137	182		33	1	1		35		31	2			33
La Union					5	5		114	1			115		22	1		5	28
Leyte		16	1		9	26		170				170		22			7	29
Marinduque		1				1												
Masbate		549	1		18	568		195	1	7		203		443			18	461
Mindoro		95	2	1	1	99		408	4			412		147	2	1	1	151
Misamis					1	1		146				146		53			1	54
Mountain Province		1	2		9	12		110	5			115		37	6		8	51
Nueva Ecija		2	2	1	4	9				1		1		2	1	1	3	7
Nueva Vizcaya		35	2		1	38		8				8		24			1	26

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value*—Continued

Province	Received from the Bureau of Lands												Certified to the Bureau of Lands—Agriculture					
	Pending from previous year						During the year 1924											
	A. C.	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total
Occidental Negros	.....	17	2	2	1	22	.....	416	1	14	.....	431	.....	103	1	1	.....	105
Oriental Negros	.....	.....	.....	.....	1	1	.....	27	.....	.....	.....	27	.....	5	.....	.....	.....	5
Palawan	.....	15	.....	.....	1	16	.....	128	3	.....	.....	131	.....	17	1	.....	.....	18
Pampanga	.....	1	.....	.....	.....	1	.....	129	.....	1	.....	130	.....	9	.....	1	.....	10
Pangasinan	.....	14	.....	.....	14	28	.....	503	3	.....	.....	506	.....	159	2	.....	13	174
Rizal	.....	.....	.....	.....	19	19	.....	34	2	10	.....	46	.....	16	1	5	19	41
Romblon	.....	12	2	.....	.....	14	.....	6	1	.....	.....	7	.....	1	.....	.....	.....	1
Samar	.....	13	.....	.....	.....	13	.....	15	1	1	.....	17	.....	1	.....	.....	.....	1
Sorsogon	.....	3	.....	.....	.....	3	.....	46	4	.....	.....	50	.....	26	2	.....	.....	28
Sulu	.....	25	2	4	.....	31	.....	19	12	.....	.....	31	.....	37	14	3	.....	54
Surigao	.....	9	1	.....	.....	10	.....	4	.....	1	.....	5	.....	5	.....	.....	.....	5
Tarlac	.....	1	.....	.....	.....	1	.....	35	.....	2	.....	37	.....	13	.....	.....	.....	13
Tayabas	.....	157	14	1	6	178	.....	183	4	1	.....	188	.....	133	8	.....	4	145
Zambales	.....	1	.....	2	3	6	.....	5	2	18	.....	25	.....	1	2	.....	3	6
Zamboanga	.....	459	26	15	1	501	.....	224	15	7	.....	246	.....	391	26	7	1	425
Total	.....	2,277	93	47	336	2,753	.....	5,451	108	91	.....	5,650	.....	2,914	104	33	150	3,201

Province	Certified to the Bureau of Lands—Forestry						Returned to the Bureau of Lands uncertified during the year 1924					Total pending for inspection December 31, 1924					
	A. C.	H.	P.	L.	F. P.	Total	H.	P.	L.	F. P.	Total	A. C.	H.	P.	L.	F. P.	Total
Abra	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	2	.....	.....	27
Agusan	.....	6	.....	.....	.....	6	8	2	1	.....	11	.....	25	.....	.....	.....	25
Albay	.....	4	.....	.....	.....	4	6	.....	.....	.....	6	.....	11	2	1	1	15
Antique	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	2	.....	128	.....	1	.....	129
Bataan	.....	2	1	.....	.....	3	11	1	1	.....	13	.....	114	3	3	1	121
Batanes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	2
Batangas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bohol	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	123	.....	6	.....	129
Bukidnon	.....	4	.....	2	.....	6	.....	.....	.....	.....	.....	.....	27	1	.....	.....	28
Bulacan	.....	2	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	18	1	.....	.....	19
Cagayan	.....	7	.....	.....	.....	7	8	1	.....	.....	9	.....	2	.....	1	.....	3
Camarines Norte	.....	45	5	.....	.....	50	10	.....	.....	.....	10	.....	100	2	.....	1	103
Camarines Sur	.....	10	.....	.....	.....	10	31	.....	.....	.....	31	.....	317	1	2	6	326

Capiz	1			1	1				1		58		2		60
Cavite		1		1											
Cebu	4	2		6	2				2		40	2	3		45
Cotabato	7			7	20	1	7		28		26				26
Davao	57	1	1	59	11				11		577	8	1		586
Ilocos Norte			1	1	1				1		8	1	1	39	49
Ilocos Sur	8			8	5				5		97	1		1	99
Iloilo					1				1		60				60
Isabela	3			3	4	3			7		11				11
Laguna	12			12	2				2		20	1			21
Lanao	12		1	13	6			136	142		23	4	1	1	29
La Union	8			8							84				84
Leyte					7				7		157	1		2	160
Marinduque											1				1
Masbate	137	1		138	57				57		107	1	7		115
Mindoro	16	3		19	13	1			14		327				327
Misamis	12			12							81				81
Mountain Province	7			7	3				3		64	1		1	66
Nueva Ecija							1		1			1		1	2
Nueva Vizcaya	1			1	5	1			6		13				13
Occidental Negros	82		5	87	6	1	1	1	9		242	1	9		252
Oriental Negros	10			10							12			1	13
Palawan		1		1	1				1		125	1		1	127
Pampanga	1			1							120				120
Pangasinan	7			7	5			1	6		346	1			347
Rizal			3	3			1		1		18	1	1		20
Romblon	1			1							16	3			19
Samar	1			1	9				9		17	1	1		19
Sorsogon	17	1		18	3				3		3	1			4
Sulu	2			2			1		1		5				5
Surigao					4				4		4	1	1		6
Tarlac	18		1	19	1		1		2		4				4
Tayabas	85	4	1	90	24	1	1		26		98	5		2	105
Zambales			1	1	2		1		3		3		18		21
Zamboanga	34	1	1	36	34	3	7		44		224	11	7		242
Total	623	21	17	661	303	15	23	138	479		3,879	59	66	58	4,062

NOTE.—A.C.=Agricultural Colony of 16 hectares lot; H=Homestead; P.=Purchase; L.=Lease; F.P.=Free Patent.

TABLE NO. 1.—*Statement of the public lands applications received from the Bureau of Lands and of the certifications made to the same regarding the agricultural or forest value*—Continued

Fiscal year	Agricultural Colonies			Homesteads			Sales			Leases		
	Agriculture	Forest	Total	Agriculture	Forest	Total	Agriculture	Forest	Total	Agriculture	Forest	Total
1905	.....	.....	.....	80	6	86	8	.....	8	.....	.....	.....
1906	.....	.....	.....	318	16	334	20	1	21	1	.....	1
1907	.....	.....	.....	881	19	900	23	.....	23	12	.....	12
1908	.....	.....	.....	2,456	51	2,507	49	1	50	26	.....	26
1909	.....	.....	.....	1,523	187	1,710	26	3	29	27	.....	27
1910	.....	.....	.....	1,175	385	1,560	34	5	39	42	2	44
1911	.....	.....	.....	1,528	221	1,749	46	3	49	30	1	31
1912	.....	.....	.....	2,609	301	2,910	95	11	106	47	1	48
1913	.....	.....	.....	2,680	269	2,949	104	30	134	47	1	48
1913 (July 1 to December 31)	.....	.....	.....	1,653	159	1,812	81	16	97	41	3	44
1914	.....	.....	.....	4,812	685	5,497	279	36	315	77	1	78
1915	1,086	28	1,114	5,965	688	6,653	317	52	369	70	1	71
1916	934	41	975	6,015	670	6,685	227	18	245	55	4	59
1917	670	.....	670	7,632	797	8,429	457	27	484	118	6	124
1918	41	.....	41	5,605	621	6,226	420	33	453	109	16	125
1919	.....	.....	.....	5,256	790	6,046	431	51	482	137	22	159
1920	.....	.....	.....	2,061	403	2,464	225	23	248	70	10	80
1921	56	.....	56	203	25	228	33	.....	33	13	2	15
1922	.....	.....	.....	2,623	523	3,146	119	21	140	53	9	62
1923	.....	.....	.....	11,279	2,123	13,402	1,197	124	1,321	183	42	225
1924	.....	.....	.....	2,914	623	3,537	104	21	125	33	17	50
Total	2,787	69	2,856	69,268	9,562	78,830	4,295	476	4,771	1,191	138	1,329

Fiscal year	Free patents			Returned uncertified to the Bureau of Lands					Grand total
	Agriculture	Forest	Total	H.	P.	L.	F. P.	Total	
1905									94
1906									356
1907									935
1908									2,583
1909									1,766
1910									1,643
1911									1,829
1912									3,064
1913									3,131
1913 (July 1 to December 31)									1,953
1914									5,890
1915									8,207
1916									7,964
1917				144	19	11		174	9,881
1918				215	11	16		242	7,087
1919				283	37	33		353	7,040
1920				309	49	22		380	3,172
1921				10	3	5		18	350
1922				152	24	6		182	3,530
1923	195		195	768	78	74		920	16,063
1924	150		150	303	15	23	138	479	4,341
Total	345		345	2,184	236	190	138	2,748	90,879

SUMMARY

Applications pending from previous years	2,753	
Applications received during 1924	5,650	
		8,403
Certified for agriculture	3,201	
Certified for forestry	661	
Returned uncertified	479	
		4,341
Total pending on December 31, 1924		4,062

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1924*

Species	Fiscal year—				July 1 to December 31, 1913
	1910	1911	1912	1913	
Red lauan					
White lauan	43,439	46,942	57,036	81,469	20,249
Apitong	20,764	21,096	28,929	32,391	12,905
Tangile	2,106	2,762	3,999	5,249	3,390
Guijo	14,107	14,231	18,579	17,279	7,841
Yakal	8,225	8,150	14,491	21,770	5,593
Ipil	13,717	12,296	17,237	15,791	7,535
Molave	8,923	7,978	9,091	9,363	4,783
Narra	5,744	4,996	8,474	8,877	3,941
Kalantas	3,174	1,368	938	3,320	886
Palosapis					
Manggachapui					
Dungon	2,453	1,693	1,213	931	601
Tindalo	954	1,018	794	932	484
Akle	809	867	1,295	1,690	729
Lumbayao					
Pagatpat					
Other species:					
First group	574	322	707	1,000	687
Second group	6,667	6,644	7,988	8,543	3,266
Third group	8,316	10,927	11,796	8,711	2,999
Fourth group	36,786	41,655	42,981	59,855	25,613
Total	176,758	182,945	225,548	277,171	101,502

Species	Fiscal year—					
	1914	1915	1916	1917	1918	1919
Red lauan						
White lauan	74,453	73,277	107,634	131,699	108,900	180,556
Apitong	32,328	38,849	52,529	55,335	56,274	72,223
Tangile	14,682	15,460	28,961	25,389	21,775	35,005
Guijo	19,701	15,650	16,685	16,857	17,301	25,924
Yakal	15,115	14,714	16,471	11,963	9,162	18,100
Ipil	17,602	12,089	14,147	16,629	15,498	18,926
Molave	9,753	10,546	10,788	13,582	22,233	26,088
Narra	8,467	9,868	7,970	5,904	7,848	11,152
Kalantas	2,423	1,999	4,574	7,381	4,975	5,040
Palosapis	2,222	1,631	2,723	3,042	8,863	15,661
Manggachapui	1,469	1,859	2,666	2,916	2,214	3,096
Dungon	2,199	1,467	1,127	1,592	1,318	1,839
Tindalo	914	1,181	1,115	1,145	826	1,080
Akle	1,287	1,498	1,088	798	870	937
Lumbayao				6,085	4,415	4,192
Pagatpat				1,502	849	2,766
Other species:						
First group	2,196	2,190	3,074	1,084	1,416	3,335
Second group	9,373	6,940	7,938	6,432	7,779	12,084
Third group	7,557	6,920	5,214	9,895	8,611	53,513
Fourth group	73,017	60,130	56,738	47,661	80,933	3,711
Total	294,758	276,268	341,442	366,891	382,060	495,228

TABLE NO. 2.—*Statement showing amounts in cubic meters of important timbers, by species cut and invoiced in the Philippine Islands during the fiscal years 1910 to 1924*—Continued

Species	Fiscal year—					Total 1910 to 1924
	1920	1921	1922	1923	1924	
Red lauan	52,294	72,986	44,377	43,104	90,706	303,467
White lauan	119,833	125,536	185,853	213,020	284,375	1,854,271
Apitong	99,775	99,652	122,561	101,747	147,103	994,461
Tangile	40,903	47,311	46,978	52,584	65,000	411,554
Guijo	28,413	30,652	26,155	26,921	27,681	323,977
Yakal	20,317	28,245	28,326	25,540	24,214	270,396
Ipil	24,720	28,556	34,621	26,159	24,604	300,127
Molave	30,173	31,826	30,840	30,195	44,793	300,955
Narra	12,711	16,164	9,032	12,414	11,649	145,211
Kalantas	8,622	5,350	3,764	8,267	6,169	68,250
Palosapis	7,594	5,928	6,098	6,397	6,165	66,324
Manggachapui	3,094	4,340	3,974	3,802	3,541	32,971
Dungon	2,607	2,726	1,829	2,873	4,258	30,726
Tindalo	1,387	3,404	1,914	1,743	1,654	19,545
Akle	2,047	1,553	1,441	3,101	1,467	21,477
Lumbayao	7,550	8,179	9,138	8,350	7,944	55,853
Pagatpat	4,743	5,454	2,240	1,854	1,926	21,334
Other species:						
First group	9,104	17,352	6,143	5,805	12,175	67,164
Second group	17,414	29,304	14,540	15,665	23,720	184,297
Third group	1,978	15,253	32,764	40,616	34,370	259,440
Fourth group	59,718	75,173	17,365	30,242	44,938	756,516
Total	554,997	653,944	629,953	660,399	868,452	6,488,316

TABLE No. 3.—*Revenue from public forests for the year 1924*

Province	Timber				Firewood		Minor forest products	Lease of forest land	Total charges and penalties
	First group	Second group	Third group	Fourth group	Bacauan tangal	Other wood			
Abra	₱2,768.86	₱1,896.91	₱568.47	₱96.99	₱18.47	₱360.63	₱272.27	.....	₱6,701.32
Agusan	1,207.45	440.35	297.23	406.21	1.00	5.70	1,633.50	.....	4,916.84
Albay	15,960.70	1,861.32	4,813.13	847.55	341.74	509.94	4,726.52	.....	31,826.78
Antique	61.61	20.78	31.61	54.69	1.13	8.50	128.88	.....	520.29
Bataan	122.70	1,420.36	4,030.44	4,152.56	709.47	1,284.83	2,822.41	₱0.40	15,983.07
Batangas	1,376.09	476.23	63.63	78.81	1.40	524.44	2,255.48	.....	5,359.44
Bohol	374.34	255.91	209.21	236.99	1,048.49	215.85	371.01	6.00	3,988.38
Bukidnon	39.99	.....	.....	70.30	.....	.....	17.87	.....	166.19
Bulacan	1,056.33	774.19	951.35	558.14	.12	225.62	1,108.28	.....	5,290.55
Cagayan	13,093.93	2,058.37	4,906.05	493.47	255.60	365.93	5,830.84	18.00	31,853.38
Camarines Norte	894.01	435.11	2,444.42	734.34	383.65	312.57	954.06	.....	6,912.09
Camarines Sur	3,087.42	1,632.07	3,229.31	868.62	154.93	422.49	5,896.65	40.48	17,541.75
Capiz	718.06	138.54	619.50	1,419.50	2,046.02	625.02	830.63	.....	7,282.96
Cavite	.....	.....	.....	.....	15.40	212.92	157.83	.....	558.69
Cebu	675.61	506.41	340.69	241.54	332.30	666.52	1,140.24	30.00	6,260.58
Cotabato	7,005.74	4,021.18	4,741.58	769.11	1,388.06	1,440.52	748.79	.....	20,121.04
Davao	1,231.33	870.27	541.16	406.17	967.90	263.41	5,588.99	.....	11,980.45
Ilocos Norte	1,759.35	594.40	349.37	80.18	3.10	107.30	84.52	.....	3,975.11
Ilocos Sur	1,236.14	50.35	166.63	10.68	.....	78.88	71.75	.28	2,529.38
Iloilo	10,092.01	3,238.29	6,133.41	6,179.78	439.40	1,246.19	3,492.54	43.00	33,214.87
Isabela	5,794.56	1,812.83	1,011.62	311.00	21.52	47.13	385.10	.28	11,794.84
Laguna	61.54	636.41	1,049.01	911.80	46.07	280.12	1,081.37	3.50	5,610.90
Lanao	210.12	168.66	332.59	256.21	.....	11.95	149.31	.....	1,372.70
La Union	415.00	263.23	190.78	46.66	4.40	51.66	99.32	.....	1,478.64
Leyte	5,473.43	1,252.70	14,819.83	1,933.94	2,311.32	167.45	5,396.51	1.19	35,000.27
Marinduque	77.74	96.75	53.19	119.56	61.90	42.06	227.64	.....	768.07
Masbate	23,542.13	1,404.49	1,165.52	1,596.07	678.94	476.89	2,026.66	278.70	32,254.32
Mindoro	4,016.54	1,739.04	616.89	503.80	2,237.08	311.89	3,695.50	84.50	14,838.75
Misamis	1,883.28	732.75	4,258.37	1,937.16	131.73	107.82	747.00	2.00	12,098.54
Mountain Province	336.03	122.55	8,795.81	491.80	38.49	1,281.31	1,319.56	.....	13,595.42
Negros Occidental	5,676.17	1,477.83	3,160.48	3,262.01	776.98	1,479.40	4,974.62	94.85	26,677.78
Negros Oriental	3,754.97	723.15	367.86	510.15	75.48	642.46	5,783.84	169.50	13,171.58
Nueva Ecija	2,631.18	916.20	284.45	417.89	89.81	191.35	1,492.31	.....	7,611.72
Nueva Vizcaya	613.73	120.85	66.45	14.56	.....	21.80	20.00	.....	891.28
Palawan	626.31	95.49	50.52	84.95	98.62	124.50	5,742.61	.....	8,552.80
Pampanga	38.09	248.57	344.27	279.23	32.90	314.47	242.24	.....	1,895.49
Pangasinan	6,919.58	3,392.43	1,175.02	571.62	622.83	342.84	1,382.60	8.00	16,770.16
Rizal	65.54	60.53	16.33	99.70	25.80	837.78	463.69	.....	1,761.60
Romblon	399.79	211.53	485.75	2.92	.....	67.02	305.87	.....	1,741.06
Samar	3,463.98	950.49	2,165.03	1,031.19	695.12	18.29	5,967.67	28.41	18,813.21
Sorsogon	12,943.90	1,410.56	932.66	972.00	614.26	120.12	1,974.93	.90	20,067.30
Sulu	15,858.94	776.73	336.04	125.16	440.07	.....	1,069.33	.....	19,739.77

Surigao	1,734.23	325.89	2,926.25	407.62	290.84	290.03	2,606.53	.....	9,690.25
Tarlac	402.64	102.62	47.62	2.64	42.10	31.20	712.27	.....	1,643.47
Tayabas	38,664.66	3,010.49	4,991.91	1,467.56	3,991.69	1,522.41	13,222.45	.....	71,463.66
Zambales	1,132.77	1,816.17	734.43	196.77	438.74	887.23	1,681.64	4.30	7,787.22
Zamboanga	7,531.63	6,683.77	35,325.05	13,992.79	2,080.28	708.26	3,668.69	87.80	72,958.12
Manila	111,349.50	26,669.63	281,892.53	129,722.69	1,812.00	378.62	18,387.39	50.00	576,407.98
Total charges	318,319.65	77,913.28	402,083.45	178,975.68	25,767.15	19,053.27	122,959.71	852.09	1,223,440.06
Total fines	25,127.57	7,290.91	11,316.79	9,911.29	3,546.34	4,241.30	16,052.36	79.12	.....
Grant total	343,447.22	85,204.19	413,350.24	188,886.97	29,313.49	23,294.57	139,012.07	931.21	1,223,440.06

NOTE.—In addition to the above revenue, ₱54,358.99 were obtained from other forestry collections such as bonds forfeited, licenses fees and rentals for the use of forest lands.

TABLE NO. 4.—*Timber licenses issued during fiscal year 1924 (January 1 to December 31, 1924)*

Province	For less than 100 cubic meters	For 100 cubic meters and less than 1,000 cubic meters	For 1,000 cubic meters and over	License Agreements	Total commercial licenses	For personal use		For public works	Miner's gratuitous licenses	Total
						Inside communal forests	Outside communal forests			
Abra	79	7	.....	.....	86	13	17	3	.....	33
Agusan	6	12	2	.....	20	19	5	3	.....	27
Albay	6	34	2	.....	42	54	17	3	4	78
Antique	9	.....	1	.....	10	6	2	3	.....	11
Bataan	2	40	2	1	45	1	.....	4	.....	5
Batangas	2	1	.....	.....	3	1	3	4	.....	8
Batanes	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Bohol	15	3	.....	.....	18	96	3	3	.....	102
Bukidnon	3	1	.....	.....	4	.....	3	6	.....	9
Bulacan	29	13	.....	.....	42	5	.....	3	1	9
Cagayan	49	50	3	.....	102	33	42	7	.....	82
Camarines Norte	11	13	4	.....	28	3	5	3	2	13
Camarines Sur	28	33	2	2	65	20	1	4	1	26
Capiz	15	26	.....	.....	41	24	11	3	.....	38
Cavite	.....	.....	.....	.....	.....	.....	.....	3	.....	3
Cebu	31	2	.....	.....	33	10	16	4	3	33
Cotabato	3	4	2	.....	9	.....	5	3	.....	8
Davao	26	17	1	.....	44	6	20	4	.....	30
Ilocos Norte	51	14	1	.....	66	57	4	3	.....	64
Ilocos Sur	51	1	.....	.....	52	38	5	5	.....	48
Iloilo	13	4	.....	.....	17	7	6	3	.....	16
Isabela	70	25	.....	.....	95	33	3	6	.....	42
Laguna	17	12	1	.....	30	2	.....	3	.....	5
Lanao	2	3	4	1	10	.....	.....	3	.....	3
La Union	27	2	.....	.....	29	16	1	6	.....	23
Leyte	46	34	5	.....	85	232	64	6	.....	302
Marinduque	7	6	.....	.....	13	4	.....	3	.....	7
Masbate	7	57	5	2	71	79	1	3	4	87
Mindoro	8	60	3	.....	71	8	5	.....	.....	16
Misamis	18	14	2	.....	34	97	54	4	.....	155
Mountain Province	32	19	2	1	54	2	6	10	6	24
Nueva Ecija	21	24	.....	.....	45	40	10	4	.....	54
Nueva Vizcaya	29	1	.....	.....	30	10	3	3	.....	16
Occidental Negros	8	43	2	2	55	7	3	3	.....	13
Oriental Negros	3	13	.....	.....	16	6	10	4	.....	20
Palawan	41	20	15	.....	76	1	23	4	.....	28
Pampanga	7	7	.....	.....	14	.....	2	3	.....	5
Pangasinan	34	49	.....	.....	83	49	4	4	4	61
Rizal	10	1	.....	.....	11	4	.....	3	.....	7
Romblon	1	10	.....	.....	11	30	5	4	.....	39
Samar	50	33	3	.....	86	96	182	3	.....	281
Sorsogon	8	20	4	.....	32	8	6	3	.....	17

Sulu		1	2		3			3		3
Surigao	35	11	1		47	48	51	4	1	104
Tarlac	11	4			15	9	1	4		14
Tayabas	61	84	5	1	149	37	2	3		42
Zambales	32	16		1	49	33	2	3		38
Zamboanga	14	13	8	5	40	70	43	5	2	120
All Provinces								1		1
Total	1,628	855	82	16	1,981	1,314	646	183	28	2,171
Total (1923)	963	923	88	15	1,989	1,876	847	177	54	2,954
Difference	+65	−68	−6	+1	−8	−562	−201	+6	−34	−783

NOTE: + = Increase; − = Decrease.

TABLE NO. 5.—*Statement of forest products cut or gathered from registered private woodlands during fiscal year 1924*

Province	Timber					Firewood		Charcoal	Tanbark	Daluru	Split rattan	Unsplit rattan, 2 centimeters in diameter or less
	First group	Second group	Third group	Fourth group	Total	First class	Second class					
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos*	*Cu. m.*	*Kilos*	*Lin. m.*
Albay		2	11	25	38							
Bataan		6	107	42	155		1,360	57				
Batangas	11	2		30	43		2,677		140			
Bulacan						534	440					
Camarines Sur	134		5		139							
Capiz						230	116	10				
Cavite							16	17				
Cebu							30					
Ilocos Norte	31	5		5	41							
Iloilo						160	597	234				
Laguna							2,396	1,288	150			
Mindoro	41	75		5	121	73	204		126		31,135	
Nueva Ecija							1,776	34	4,550			65,150
Occidental Negros			18	93	111		2,881					
Oriental Negros	286				286							
Palawan	58				58							
Pampanga						11,440	37,789	311		6		
Rizal	63	54	16	146	279		11,787		4,945			
Romblon	23	3			26							
Samar	1				1							
Tarlac				74	74		15,857					
Tayabas	104				104		10	1				
Zambales	5				5							
Total	757	147	157	420	1,481	12,437	77,936	1,952	9,911	6	31,135	65,150

TABLE No. 5.—*Statement of forest products cut or gathered from registered private woodlands during fiscal year 1924*—Cont.

Province	Diliman	Limestone	Gogo	Buri	White earth	Nipa	Dyebark	Beeswax	Hingiw	Boho	Lumbang seeds	
											Unhusked	Kernels
	Kilos	*Kilos*	*Kilos*	*Kilos*	*Balls*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Pieces*	*Kilos*	*Kilos*
Albay												
Bataan	60									118,240		
Batangas		19,200		2,880								
Bulacan						136,000						
Camarines Sur												
Capiz						2,030,133			1,200			
Cavite												
Cebu												
Ilocos Norte												
Iloilo												
Laguna					48,000						24,468	37,524
Mindoro	5,225					35,000		114				
Nueva Ecija	690		720	500								
Occidental Negros												
Oriental Negros						2,800						
Palawan			400				80					
Pampanga						543,423						
Rizal							1,010			2,050		
Romblon												
Samar												
Tarlac				32,960								
Tayabas												
Zambales												
Total	5,975	19,200	1,120	36,340	48,000	2,747,356	1,090	114	1,200	120,290	24,468	37,524

TABLE No. 6.—*Minor product licenses issued during fiscal year 1924 (January 1 to December 31, 1924)*

Province	Firewood	Charcoal	Dyewood	Tanbarks and dyebark	Wood oils	Almaciga resins and others	Gutta-percha	Bejuco and diliman	Gogo	Sand gravel and stone	Others	Total
Abra	16							9			11	36
Agusan	3	2				1		19	1		4	30
Albay	31	2				1		28		1	1	64
Antique	2			1				6			1	10
Bataan	22	14						27	6		6	75
Batangas	2								5		4	11
Bohol	15	1							1		8	25

Bukidnon	1							1				2
Bulacan	10	8				1		12	3		1	35
Cagayan	16	1	2					47			25	91
Camarines Norte	11			2		6		16		1	7	43
Camarines Sur	28			4		9		78	1			120
Capiz	29	1		2				11				43
Cavite	4				1						1	6
Cebu	66	3						1		9	31	110
Cotabato	10				5	1	1	3			6	26
Davao	19	1		2	9	8		16			10	65
Ilocos Norte	5							2			3	10
Ilocos Sur	3							1		1	6	11
Iloilo	31	6	4	6				10			3	60
Isabela	8					1		29			40	78
Laguna	4	1						23	3	2	11	44
Lanao	5							2			4	11
La Union	3			4					1		3	11
Leyte	32	3			3	4		57		4	7	110
Marinduque	10	2		1				13	1		1	28
Masbate	30			6				21			5	62
Mindoro	44	1		30		1		70	10		18	174
Misamis	7							18			1	26
Mountain Province	18	1						25	1	2	9	56
Nueva Ecija	2			1	1	4	1	26	7		8	50
Nueva Vizcaya	2							7			2	11
Occidental Negros	48				3	7		109	15		6	188
Oriental Negros	22				2	3		45	8		1	81
Palawan	5			12		18		15	1		9	60
Pampanga	4	1						4			7	16
Pangasinan	25	1		18		3		5	1		10	63
Rizal	18	3		1				18	10		4	54
Romblon						5		3				8
Samar	33			2				74			2	111
Sorsogon	20	1		3	6	2		16	1	2		51
Sulu				1	1							2
Surigao	8	1		2				16	1			28
Tarlac				1		4		11	6	1		23
Tayabas	84	19		21	3	24		81	1	18	23	274
Zambales	31	2		1		2		24	8		28	96
Zamboanga	23	3		6		2	5	34		1	11	85
Total	810	78	6	127	34	107	7	1,033	92	42	338	2,674
Total (1923)	892	85	11	141	5	124	6	928	109	44	336	2,681
Difference	−82	−7	−5	−14	+29	−17	+1	+105	−17	−2	+2	−7

NOTE: + = Increase; − = Decrease.

NOTE.—In the provinces of Cebu and Laguna there were 10 special licenses issued within the Friar Lands Estate.

TABLE NO. 7.—*Statement of forest products utilized from public forests of the Philippine Islands during the fiscal year 1924 (January 1 to December 31, 1924)*

Province	Timber					Firewood class		Charcoal	Dyewood	Tanbark
	Group				Total					
	First	Second	Third	Fourth		First	Second			
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Kilos*	*Kilos*
Abra	1,140	1,233	560	202	3,135	.....	4,872	.....	.....	.....
Agusan	377	372	494	634	2,077	.....	35	6	.....	.....
Albay	9,621	7,367	6,144	2,118	25,250	2,204	5,113	40	.....	1,864
Antique	58	30	43	125	256	.....	24	.....	.....	2,100
Bataan	68	3,844	11,643	18,318	33,873	4,642	15,231	2,366	.....	618
Batangas	68	37	87	103	295	7	2,552	68	.....	3,526
Bohol	137	226	230	1,014	1,607	6,500	3,278	2	.....	.....
Bukidnon	14	.....	.....	.....	14	.....	700	.....	.....	.....
Bulacan	426	506	933	1,216	3,081	64	738	544	.....	4,973
Cagayan	6,908	1,089	5,042	946	13,985	1,325	4,024	.....	.....	5,050
Camarines Norte	539	336	3,980	1,704	6,559	1,786	1,258	.....	.....	9,290
Camarines Sur	2,270	3,403	8,909	23,003	37,585	737	4,398	1	.....	35,726
Capiz	256	126	766	1,944	3,092	9,902	9,030	116	.....	1,568
Cavite	.....	.....	.....	6	6	.....	3,267	48	.....	1,452
Cebu	117	201	331	201	850	190	5,147	108	.....	20,948
Cotabato	4,328	4,282	5,086	2,224	15,920	1,375	14,801	.....	.....	530
Davao	355	649	882	1,832	8,718	1,514	2,140	75	.....	26,770
Ilocos Norte	715	505	500	169	1,889	29	1,070	.....	17	1,350
Ilocos Sur	371	30	50	30	481	.....	376	.....	.....	.....
Iloilo	212	123	83	239	657	2,005	14,471	686	230,308	236,361
Isabela	2,211	1,126	977	534	4,848	.....	510	.....	.....	.....
Laguna	48	405	1,042	1,692	3,187	.....	2,449	85	.....	.....
Lanao	322	458	35,045	25,001	60,826	51	264	.....	.....	.....
La Union	218	196	173	81	668	.....	727	.....	.....	5,274
Leyte	2,041	627	10,805	8,035	16,508	8,058	943	42	.....	1,040
Marinduque	21	80	58	213	372	4,594	3,166	278	.....	92
Masbate	12,251	1,098	1,554	2,925	17,828	6,152	1,634	.....	.....	14,949
Mindoro	2,986	5,067	1,858	6,601	16,512	14,221	4,564	6	.....	90,030
Misamis	604	395	3,861	4,116	8,976	330	944	.....	.....	1,479
Mountain Province	1,025	360	12,882	43	14,310	.....	10,132	84	.....	.....
Nueva Ecija	1,258	848	303	510	2,919	.....	1,208	5	.....	14,667
Nueva Vizcaya	265	97	64	32	458	.....	218	.....	.....	.....
Occidental Negros	4,215	3,072	135,643	166,241	309,171	5,490	14,243	.....	.....	8,370
Oriental Negros	626	508	502	931	2,567	39	7,230	.....	.....	.....
Palawan	24,404	942	1,710	2,631	29,687	1,079	2	.....	.....	319,413
Pampanga	10	162	352	501	1,025	140	2,365	31	.....	840
Pangasinan	2,311	2,254	1,229	1,363	7,157	4,107	1,970	138	.....	219,030
Rizal	24	69	43	385	521	.....	10,295	156	.....	335
Romblon	275	134	451	59	919	.....	.....	.....	.....	.....

Samar	2,338	900	8,382	3,194	14,814	7,333	347		160	24,162
Sorsogon	5,809	1,124	1,512	3,362	11,807	2,705	1,275	25	2	16,932
Sulu	6,490	980	344	471	8,285	3,364	913		54	56,815
Surigao	960	351	882	689	2,882	1,222	6,777	17		15,337
Tarlac	137	76	64	6	283		238	3		15,312
Tayabas	22,310	4,414	46,109	12,353	85,186	12,531	12,202	2,290		285,638
Zambales	613	2,346	1,763	1,354	6,076	2,171	8,863			10,473
Zamboanga	4,973	6,752	39,843	34,762	86,330	7,441	4,068	89		290,186
Total	126,725	59,200	353,214	329,313	868,452	113,316	190,072	7,309	230,524	1,737,500
Total (1923)	113,224	49,261	254,652	243,262	660,399	119,869	167,399	8,551	773,798	1,762,338
Difference	+13,501	+9,939	+98,562	+86,051	+208,053	—6,553	+22,673	—1,242	—543,274	—24,838

Province	Oleoresin	Manila copal	Daluru	Guttapercha	Split rattan	Unsplit rattan		Diliman	Limestone	Gogo
						Over 2 cms. in diameter	2 cms. in diameter or less			
	Kilos	*Kilos*	*Cu. m.*	*Kilos*	*Kilos*	*Lin. m.*	*Lin. m.*	*Kilos*	*Kilos*	*Kilos*
Abra					150		337,310		16,000	
Agusan					77,393	328	22,641	100		
Albay					203,789		4,000			
Antique					4,938			15		
Bataan					35,648	13,510	93,410	1,720		2,806
Batangas					2,319			1,254		79,731
Bohol	150	15			678			1,255		374
Bukidnon										
Bulacan		671			7,456	96,917	366,239			260
Cagayan					190,039	5,130	70,871	45		4
Camarines Norte		6,319			104,045		5,065	722	11,400	
Camarines Sur		307,044	4		330,280	1,903	247,577	1,813		516
Capiz					10,829			3,853		
Cavite										59
Cebu	16		1		208					
Cotabato				2,972	50					
Davao		265,316			24,112	4,186	230,000	1,055		49
Ilocos Norte					856				33,000	
Ilocos Sur					120				26,983	
Iloilo					11,429			2,045		179
Isabela					12,506	10,780	355,842			
Laguna	40				19,530	13,950		4,221		798
Lanao					1,580	3,060		5,610		
La Union										402
Leyte	15,531				116,040	142,925	284,876	40,503		
Marinduque					4,499			13,340		
Masbate					93,984			1,000		1,025
Mindoro					95,494	2,780	35,410	23,540		1,353

NOTE: + = Increase; — = Decrease.

TABLE NO. 7.—*Statement of forest products utilized from public forests of the Philippine Islands during fiscal year 1924 (January 1 to December 31, 1924)*—Continued

Province	Oleoresin	Manila copal	Daluru	Guttapercha	Split rattan	Unsplit rattan		Diliman	Limestone	Gogo
						Over 2 cms. in diameter	2 cms. in diameter or less			
	Kilos	*Kilos*	*Cu. m.*	*Kilos*	*Kilos*	*Lin. m.*	*Lin. m.*	*Kilos*	*Kilos*	*Kilos*
Misamis					30,133	1,152	1,372	1,115		
Mountain Province					64,744	128,900	322,600		802,793	
Nueva Ecija		1,481			36,835	16,230	353,650	500		15,910
Nueva Vizcaya						450	5,136			
Occidental Negros	11,227				240,999	16,183	85,927	9,158		8,993
Oriental Negros	83,522				178,289	267	1,650	8,456		10,190
Palawan	159	124,157			3,684		1,145,566	77		19,695
Pampanga			48		1,618		937			1,449
Pangasinan		518	83		6,072	3,000	39,800	200		
Rizal					11,029					1,868
Romblon	10,565	2,110			4,295		17,406			
Samar	534				355,768	1,200	33,580	9,612		
Sorsogon	27,541				57,389					
Sulu	100									
Surigao					150,082			245		
Tarlac					15,824	7,500	371,621			5,924
Tayabas		64,863			395,519	1,059,666	2,146,310	5,540		1,102
Zambales	200	1,140	10		13,800	56,970	1,228,475			16,257
Zamboanga		5,369		6,478	76,512		300	3,216		
Total	149,585	779,003	146	9,450	2,990,567	1,638,987	7,807,571	140,184	890,176	168,944
Total (1923)	63,085	614,396	170	13,772	2,627,500	1,608,789	6,640,798	128,064	423,471	149,925
Difference	+86,500	+164,617	—24	—4,323	+363,067	+30,198	+1,166,773	+12,120	+466,705	+19,019

Province	Stone, sand, and gravel	Buri	Guano	Nipa	Dyebark	Cabonegro	Hingiw	Fern tree	Nipa sap	Manila elemi
	Cu. m.	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Kilos*	*Whole*	*Liters*	*Kilos*
Abra										
Agusan				79,309			500			
Albay				101,306						
Antique										
Bataan				46,530			430			
Batangas		55,073			660	2,699	800			
Bohol	25		2,155,119	576,562						
Bukidnon										

Bulacan				5,252						
Cagayan				435,885					557,832	
Camarines Norte				21,010						
Camarines Sur				48,460			490	40		
Capiz		3,315		282,825	4,385		2,163			
Cavite							37			
Cebu	4,141	10,014		59,382			7,395			
Cotabato				42,750						2,672
Davao	176			85,852						
Ilocos Norte					4,150					
Ilocos Sur										
Iloilo			602,300	28,600						
Isabela										
Laguna		979				20,720	14,241	123		
Lanao				2,520						
La Union										
Leyte	120			117,341	72					
Marinduque		1,500					435			
Masbate		26,070		16,680	1,650		5,275			3,700
Mindoro		15,757	320,000	838,083	27,015		406			
Misamis			500,000	4,400						
Mountain Province	10							156		
Nueva Ecija		45,000								
Nueva Vizcaya										
Occidental Negros		50	1,669	356,869						
Oriental Negros		5,100		551,715						
Palawan				74,850	27,992					
Pampanga		29,932		2,850						
Pangasinan		2,384		400						
Rizal					1,065		760			
Romblon		5,253								
Samar	13			61,868	206		1,098			15
Sorsogon	19			15,760						
Sulu				1,000						55
Surigao				6,360						
Tarlac		105								
Tayabas	14,911	67,842		11,038	2,438	3,033	13,725			108,642
Zambales			120,000	162,360						
Zamboanga				87,150			1,786			60
Total	19,415	268,374	3,699,088	4,124,967	69,633	26,452	49,041	819	557,832	115,144
Total (1923)	11,375	443,381	5,465,039	3,663,776	107,007	39,981	41,740	423		42,027
Difference	+8,040	—175,007	—1,765,951	+461,191	—37,374	—13,529	+7,301	—194	+557,832	+73,117

NOTE: + = Increase; — = Decrease.

TABLE No. 7.—*Statement of forest products utilized from public forests of the Philippine Islands during fiscal year 1924 (January 1 to December 31, 1924)*—Continued

Province	Sálago bark	Beeswax	Beeswax refined	Christmas tree	Mortar (stone)	Kamagsa	Boho	Lumbang oil	Lumbang seeds	
									Unhusked	Kernels
	Kilos	*Kilos*	*Kilos*	*Lin. m.*	*Kilos*	*Kilos*	*Pieces*	*Liters*	*Kilos*	*Kilos*
Abra		185					16,085			
Agusan							905			
Albay	30						4,741			
Antique	70									
Bataan							216,570			
Batangas									9,695	48,905
Bohol										
Bukidnon										
Bulacan							61,050			
Cagayan							294,931			
Camarines Norte										
Camarines Sur							7,140			
Capiz										
Cavite									1,731	
Cebu										
Cotabato		5,689							58,167	53,364
Davao		490						3,057	146,382	40,501
Ilocos Norte							100			
Ilocos Sur					247		3,700			
Iloilo							160			
Isabela							188,853			
Laguna						14,388			4,890	3,373
Lanao										
La Union							15,070			
Leyte							100			
Marinduque										
Masbate										
Mindoro		89								
Misamis										
Mountain Province		47	19	548			6,700			
Nueva Ecija							4,100			
Nueva Vizcaya							2,400			
Occidental Negros							3,900			
Oriental Negros										
Palawan		2,171	434							
Pampanga							23,950			
Pangasinan							22,330			
Rizal						4,850	10,150			
Romblon										
Samar							27,440			
Sorsogon						250				

Sulu									94,740	19,261
Surigao										
Tarlac							1,710			
Tayabas							700		15,096	13,749
Zambales							28,350			
Zamboanga		1,008					350			3,961
Total	100	9,679	453	548	247	19,488	941,485	3,057	330,701	183,114
Total (1923)	1,559	6,244	13,509	1,013	30,290	33,430	34,161	5,972	165,673	17,558
Difference	—1,459	+3,435	—12,056	—465	30,043	—13,942	+907,324	—2,915	+165,028	+165,556

NOTE: + = Increase; — = Decrease.

NOTE.—In addition to the above figures on timber there were 127 table tops manifested in the Provinces of Agusan, Cagayan, Cotabato, Isabela, Laguna, Mountain Province, and Samar.

TABLE NO. 8.—*Status of illegal caingins reported during the fiscal year from January 1 to December 31, 1924*

Provinces	Number of cases	Area cleared in hectares	Forest products destroyed						Total forest charges
			First group	Second group	Third group	Fourth group	Firewood	Total volume in cu. m.	
Abra	65	47.93	139.22	882.89	749.39	2,058.98	2,797.95	6,628.43	₱7,209.66
Agusan	2	3.25		4.80	143.76	63.00		211.56	364.92
Albay	60	70.76	205.84	1,121.95	966.37	2,170.56		4,464.72	9,173.98
Antique	7	20.55			473.24	2,590.64		3,063.88	3,604.24
Bataan	3	4.00	[a]	[a]	[a]	[a]	[a]	270.00	54.00
Batanes									
Batangas									
Bohol	20	6.06	13.35	106.97	54.28	223.75		398.35	693.12
Bukidnon	25	22.15	8.45	34.01	294.02	1,371.37		1,707.85	2,062.80
Bulacan	2	1.00		1.89	5.66	32.09		39.55	46.82
Cagayan	22	35.40	176.99	333.02	243.70	595.59		1,349.30	2,998.28
Camarines Norte	45	33.07	76.05	117.55	821.31	401.19		1,416.10	2,734.73
Camarines Sur	178	121.41	498.73	493.15	1,785.70	2,502.36		5,279.94	9,828.67
Capiz									
Cavite									
Cebu	43	40.86	54.77	149.26	445.12	2,020.50		2,669.65	2,381.34
Cotabato	26	46.50			490.00	1,820.00		2,310.00	2,830.00
Davao	10	14.10	15.45	11.99	16.55	79.80		123.79	289.00
Ilocos Norte	70	34.91	600.00	600.00	1,200.00	1,800.00	153.00	4,353.00	8,738.00
Ilocos Sur	20	10.48	7.14	20.22	10.89	80.65	191.00	309.90	227.46
Iloilo	8	13.50	1.92	27.18	43.29	136.09		208.48	328.07
Isabela	1	1.00							
Laguna	6	4.00		39.87	131.02	360.36		531.25	741.82
Lanao	16	15.00		9.07	981.77	1,256.43		2,247.27	3,058.72

[a] No report on group classification given.

TABLE NO. 8.—*Status of illegal caiñgins reported during the fiscal year from January 1 to December 31, 1924*—Continued

Provinces	Number of cases	Area cleared in hectares	Forest products destroyed						Total forest charges
			First group	Second group	Third group	Fourth group	Firewood	Total volume in cu. m.	
La Union	3	3.00	3.00	13.00	.....	50.00	.....	66.00	₱104.00
Leyte	73	45.33	28.40	89.10	496.96	1,945.56	.....	2,560.02	3,474.51
Marinduque	7	21.70	57.88	119.74	234.89	557.67	.....	970.18	1,676.16
Masbate	137	77.24	265.52	194.18	1,483.09	2,030.07	.....	3,972.86	6,909.72
Mindoro	8	3.00	3.01	9.31	.65	115.02	.....	127.99	160.17
Misamis	92	88.06	45.60	75.68	1,298.98	4,997.10	.....	6,417.36	8,066.48
Mountain Province	48	8.05	33.54	52.02	87.90	419.04	.....	592.50	992.54
Nueva Ecija	16	39.75	31.73	313.58	159.11	450.69	.....	955.11	1,172.38
Nueva Vizcaya	11	6.89	15.00	130.32	146.07	168.38	.....	459.77	897.62
Occidental Negros	73	110.08	482.95	1,828.02	2,317.62	6,865.11	.....	11,493.70	19,058.93
Oriental Negros	58	70.00	12.38	182.16	5,544.78	7,374.07	.....	13,113.39	18,951.09
Palawan	156	115.75	294.33	250.96	249.59	449.20	.....	1,244.08	1,793.91
Pampanga [b]	18	15.25	3.64	1.51	.....	1.67	75.00	81.82	149.04
Pangasinan [b]	39	35.25	19.87	223.82	307.35	423.53	370.00	1,344.57	1,960.66
Rizal	.....	.....	.....	.....	.....	.....	.....	.....	.....
Romblon	.....	.....	.....	.....	.....	.....	.....	.....	.....
Samar	213	81.32	224.65	480.22	3,731.86	3,543.36	.....	7,980.09	13,402.22
Sorsogon	92	45.87	33.43	798.63	2,120.14	3,323.40	.....	6,275.60	9,382.99
Sulu	.....	.....	.....	.....	.....	.....	.....	.....	.....
Surigao	1	.....	.....	.....	.....	.....	.....	.....	.....
Tarlac	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tayabas	39	40.43	148.58	275.68	1,149.07	1,309.37	.....	2,882.70	5,116.22
Zambales [b]	22	26.64	70.83	322.01	363.46	324.74	.....	1,081.04	2,381.40
Zamboanga	18	17.36	2.66	103.90	39.60	108.01	.....	254.17	905.87
Total	1,753	1,396.90	3,574.91	9,417.57	28,587.19	54,019.35	3,586.95	99,455.97	153,921.54
Total (1923)	1,759	1,546.33	3,722.63	7,898.34	31,156.57	38,464.23	1,644.00	82,885.77	130,899.30
Difference	—6	—149.43	—147.72	1,519.23	—2,569.38	15,555.12	1,942.95	16,570.20	23,022.24

NOTE.—The minus sign (—) means decrease.

Provinces	Number of cases reported to—		Number of invoices reported to treasurers	Pending report	Results of action taken					
	Provincial fiscal	Justice of peace			Convicted	Dropped or acquitted	Pending	Collected		Warned
								Number	Amount	
Abra			45				44	1	16.32	20
Agusan			2				2			
Albay		51	9		8	1	49	2	12.84	
Antique	7						7			
Bataan				3						
Batanes										
Batangas										
Bohol		10	10				17	3	85.14	
Bukidnon										25
Bulacan		2					2			
Cagayan	4	2	8	8	2		10	2	75.02	
Camarines Norte		38	7		15		29	1	16.72	
Camarines Sur	1	80	97		46	2	113	17	577.71	
Capiz										
Cavite										
Cebu	1	36	3	3	24		15	1	18.36	
Cotabato										26
Davao		6		4	1		5			
Ilocos Norte			14					14	31.60	56
Ilocos Sur			16				11	5	11.20	4
Iloilo		3	5		1		6	1	15.42	
Isabela										1
Laguna	2	3	1				5	1	13.14	
Lanao	1	10				1	10			5
La Union										3
Leyte	2	15	30	26	10		35	2	31.98	
Marinduque	2			5	2					
Masbate		135	2		14	3	120			
Mindoro			8				5	3	65.24	
Misamis		9	1	4			10			78
Mountain Province		1	3				3	1	5.02	44
Nueva Ecija		3	5	4	3		3	2	208.90	4
Nueva Vizcaya		1			1					10
Occidental Negros	2	69	2		3		70			
Oriental Negros	13	29	2		23	1	18	2	31.96	14
Palawan		14		22	1		13			120
Pampanga [b]			9	9			9			
Pangasinan [b]	3	7	14		1	2	13	8	250.08	15
Rizal										
Romblon										
Samar	1	211	1		174	33	5	1	10.30	

[b] Practically 90,000 pieces of bohos have been included in three cases reported in Pangasinan and Zambales. Six cases of boho areas have also been detected in Pampanga, but no report has thus far been submitted.

TABLE NO. 8.—*Status of illegal caingins reported during the fiscal year from January 1 to December 31, 1924*—Continued

Provinces	Number of cases reported to—		Number of invoices reported to treasurers	Pending report	Results of action taken					
	Provincial fiscal	Justice of peace			Convicted	Dropped or aquitted	Pending	Collected		Warned
								Number	Amount	
Sorsogon	4	88	.....	.....	32	2	58	.....	.....	.....
Sulu	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Surigao	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Tarlac	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tayabas	8	13	16	.....	9	2	19	7	386.23	2
Zambales [b]	3	14	.....	.....	14	.....	3	.....	.....	5
Zamboanga	.....	2	2	.....	.....	2	1	1	13.55	14
Total	54	852	312	88	384	49	710	75	1,876.75	447
Total (1923)	66	963	214	366	424	39	692	88	3,180.75	150
Difference	—12	—111	98	—278	—40	10	18	—13	—1,304.02	297

NOTE.—The minus sign (—) means decrease.

[b] Practically 90,000 pieces of bohos have been included in three cases reported in Pangasinan and Zambales. Six cases on boho areas have also been detected in Pampanga, but no report has thus far been submitted.

TABLE NO. 9.—*Status of caingin applications acted upon during the period from January 1 to December 31, 1924*

Provinces	Caingin agreements	Collective Caingin permits	Caingin permits			Area granted in hectares	Approved	Disapproved	Pending inspection	Total number of applications received
			Public lands	Private lands	Leased lands					
Abra	.....	.....	4	5	.....	9.00	9	.....	.....	9
Agusan	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Albay	.....	.....	5	29	.....	69.50	34	.....	.....	34
Antique	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bataan	.....	.....	4	.....	.....	4.00	4	.....	.....	4
Batanes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Batangas	.....	.....	1	1	.....	102.00	2	.....	.....	2
Bohol	.....	.....	.....	.....	.....	.....	.....	2	.....	2
Bukidnon	.....	.....	1	.....	.....	.80	1	.....	.....	1
Bulacan	.....	.....	7	.....	.....	10.00	7	.....	.....	7

Cagayan			6	1		1.23	7	5	1	13
Camarines Norte			13			21.00	13			13
Camarines Sur			46	24		86.70	70	33		103
Capiz										
Cavite										
Cebu								7	5	12
Cotabato			6			12.00	6			6
Davao		32	411	31	8	1,954.70	482	7	66	555
Ilocos Norte		1	3	2		75.95	6		9	15
Ilocos Sur			212	1		93.13	213			213
Iloilo										
Isabela			11			25.00	11			11
Laguna			5	4		29.25	9			9
Lanao			2			4.00	2			2
La Union			137			87.61	137	1	1	139
Leyte			4			8.00	4			4
Marinduque			1			1.00	1			1
Masbate			8			12.00	8			8
Mindoro			35	2		112.50	37			37
Misamis			95	8		230.00	103			103
Mountain Province	18		223	2		54.80	243	2		245
Nueva Ecija			8			48.00	8	3		11
Nueva Vizcaya			13			6.40	13			13
Occidental Negros			75	10		101.65	85			85
Oriental Negros			8	1		18.00	9	12	8	29
Palawan		5	87			125.00	92			92
Pampanga			21			58.25	21			21
Pangasinan		7	77			195.00	84	3	8	95
Rizal										
Romblon										
Samar			84	38		120.02	122	9	38	169
Sorsogon			5	2		13.83	7			7
Sulu										
Surigao			4	1		12.76	5	9		14
Tarlac			5			4.50	5			5
Tayabas			302	16		597.47	318		7	325
Zambales			2	3		4.18	5			5
Zamboanga		24	135	44		388.30	203	1	8	212
Total	18	69	2,066	225	8	4,697.53	2,386	95	151	2,632
Total (1923)	133	115	2,953	465	57	7,850.00	3,723	200		3,923
Difference	—115	—46	—887	—240	—49	—3,152.47	—1,337	—105	151	—1,291

NOTE.—The minus sign (—) means decrease.

TABLE No. 10.—*Status of special permit applications on December 31, 1924*

Applications	Received		Total applications December 31, 1924	Applications disapproved		Lease cancelled		Permits cancelled		Issued previous years	
	Previous years	1924		Previous years	1924	Previous years	1924	Previous years	1924	Lease	Permits
Fishpond	744	235	979	388	89	23	.....	4	14	38	168
Saltworks	57	18	75	21	3	2	.....	1	4	12	13
Pastures	541	415	956	89	73	.....	.....	45	44	.....	320
Residence	544	1,967	2,511	56	238	.....	.....	1	34	.....	179
Sawmill site	18	9	27	5	7	.....	.....	.....	1	4	7
Sanatoria	1	.....	1	.....	.....	.....	.....	.....	.....	1	.....
Special uses	12	2	14	4	2	.....	.....	.....	.....	.....	2
Special gratuitous permits	7	3	10	.....	.....	.....	.....	1	2	.....	7
Hotel site	.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....
Number of applications received by local forest officers unrecorded in Manila Office	.....	436	436	.....	.....	.....	.....	.....	.....	.....	.....
Total	1,924	3,087	5,011	563	412	25	.....	52	99	55	696
Total (1923)	1,003	921	1,924	403	160	.....	.....	15	37	55	261
Difference	921	2,166	3,087	160	252	25	.....	37	62	0	435

Applications	Issued 1924		Leases and permits in force	Area in hectares covered by leases and permits in force	Annual rentals on leases and permits in force	Pending			
	Lease	Permits				Claim	Issue	Inspection	Total pending
Fishpond	2	142	309	2,280.26	₱3,421.50	21	50	81	152
Saltworks	.....	13	31	185.19	279.00	1	4	8	13
Pastures	.....	300	531	19,684.67	9,842.50	6	60	108	174
Residence	.....	1,655	1,799	5,102.49	2,551.50	1	150	232	383
Sawmill site	.....	4	14	41.95	63.00	.....	.....	.....	.....
Sanatoria	.....	.....	1	2.60	2.00	.....	.....	.....	.....
Special uses	.....	1	3	29.38	45.00	.....	5	.....	5
Special gratuitous permits	.....	3	7	59.33	.....	.....	.....	.....	.....

Hotel site		2	2	18.31	28.50				
Number of applications received by local forest officers unrecorded in Manila Office								436	436
Total	2	2,120	2,697	27,403.58	16,233.00	29	269	865	1,163
Total (1923)		435	616	15,051.54	9,391.16	42	75	327	610
Difference	2	1,685	2,081	12,352.04	6,841.84	—13	194	538	553

Applications	Received		Total applications December 31, 1924	Applications disapproved		License agreements cancelled		License agreements issued		O. M. Licenses issued		Permits issued		License agreements and permits in force	Pending				Area granted in hectares
	Previous years	1924		Previous years	1924	Previous years	1924	Previous years	1924	Previous years	1924	Previous years	1924		Claim	Inspection	Issue	Total pending	
Firewood concession	13	.....	13	4	.....	5	.....	7	.....	2	.....	.....	.....	2	.....	.....	.....	.....	111.85
Nipa and bacauan plantation	72	30	102	29	19	.....	5	.....	.....	29	.....	.....	22	17	.....	.....	3	3	33.62
Total	85	30	115	33	19	5	5	7	.....	31	.....	.....	22	19	.....	.....	3	3	145.47
Total (1923)	66	19	85	27	6	4	1	7	.....	5	5	.....	.....	2	.....	14	.....	14	5.2883
Difference	19	11	30	6	13	1	4	0	.....	26	—5	.....	22	17	.....	—14	3	—11	140.1817

NOTE.—The minus sign (—) means decrease.

The total amount of cash bond for Special Uses up to December 31, 1924, is ₱14,149, while the sum of ₱6,450 is covered by surety bonds. The amount of annual rental collected during the year is shown in the following table.

TABLE No. 11.—*Revenue derived from annual rentals of forest land covering the period from the year 1919 to 1924*

Province	1919	1920	1921	1922	1923	1924
Abra					₱16.50	₱195.00
Agusan						
Albay				₱57.50	106.00	163.00
Antique				5.00	5.00	5.00
Bataan					86.50	133.00
Batanes						
Batangas			₱1.00	20.50	20.00	
Bohol						12.40
Bukidnon						475.00
Bulacan					50.00	9.00
Cagayan			12.50	508.00	214.00	394.50
Camarines Norte						14.00
Camarines Sur				174.90	649.26	983.56
Capiz				10.50	16.50	27.00
Cavite						
Cebu		₱86.81	61.31	316.13	419.50	556.50
Cotabato				3.36		
Davao				17.40	41.50	265.50
Ilocos Norte					81.00	81.00
Ilocos Sur				11.50	211.50	752.00
Iloilo		16.58		132.60	313.10	707.50
Isabela				243.00	312.00	915.00
Laguna					11.50	
Lanao						6.50
La Union			2.00	60.00	348.50	271.00
Leyte				20.10		59.10
Manila	₱104.50	141.71	111.00	1,024.84		
Marinduque						3.00
Masbate			131.00	274.50	191.00	820.26
Mindoro				309.00	199.00	563.50
Misamis					24.00	253.14
Mountain Province				4.50	101.50	401.00
Nueva Ecija				516.00	561.26	451.50
Nueva Vizcaya				46.75	384.26	1,132.50
Occidental Negros				8.70	28.50	308.50
Oriental Negros				73.50	96.00	
Palawan				38.50	267.50	974.04
Pampanga					36.50	43.50
Pangasinan				94.45	469.64	1,011.08
Rizal				1.50	1.50	262.00
Romblon						3.00
Samar						33.85
Sorsogon		100.00	66.00		12.00	50.00
Sulu						
Surigao						11.50
Tarlac					53.50	13.00
Tayabas		10.50	51.15	14.00	645.00	168.00
Zambales				130.50	533.50	1,059.06
Zamboanga					9.00	62.00
Total charges	104.50	355.60	435.96	4,043.79	6,516.02	13,654.27
Additional charges				73.44		139.86
Advance rentals						831.39
For a certified copy						1.00
Grand total	104.50	355.60	435.96	4,117.23	6,516.02	14,626.52

NOTE.—In addition to the above the Collector of Internal Revenue has collected ₱931.21 as annual rental for 1924.

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*

ABRA

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous									
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	67	.....	.....	602.74	434.30	106.64	264.22	.....	.....	.....	.....
1919	77	6	.....	670.52	603.29	224.03	255.41	15.36	2.36	.31	1.42
1920	102	24	1	824.17	670.92	427.44	323.58	59.76	13.80	.....	.....
1921	120	23	4	1,199.21	764.71	644.78	317.71	100.36	5.34	2.25	.34
1922	136	18	3	1,136.43	1,035.60	366.34	227.29	38.27	25.94	13.09	7.77
1923	112	2	.....	815.52	1,168.31	450.82	211.84	2.74	2.64	8.24	.....
Total	614	73	9	5,248.59	4,677.13	2,220.05	1,600.05	216.49	50.08	23.89	9.53

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	1,407.90	.....	₱2,397.05	.....	4	.....	₱2,397.05
1919	1,753.25	19.45	2,937.98	₱42.96	1	.....	2,937.98
1920	2,246.11	73.56	3,656.04	169.10	8	.....	3,656.04
1921	2,926.41	108.29	4,948.72	261.33	23	.....	4,948.72
1922	2,765.66	85.07	4,874.52	151.02	12	.....	4,874.52
1923	2,646.49	13.62	4,348.01	19.05	8	.....	4,348.01
Total	13,745.82	299.99	23,162.32	643.46	56	.....	23,162.32

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

AGUSAN

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	5	4	.....	22.11	8.06	.....	.....	38.38	2.65	.....	.....
1919	12	10	.....	349.63	37.76	3.38	4.34	93.25	1.68	.....	.....
1920	15	18	.....	1,258.08	88.88	6.38	.....	202.36	6.79	16.21	32.28
1921	30	11	.....	2,538.45	266.25	88.01	72.47	105.21	.....	6.59	.....
1922	26	6	.....	371.92	102.71	41.46	25.98	32.62	.....	25.50	.....
1923	9	.....	.....	209.95	193.38	30.68	133.43	.....	.....	.....	.....
Total	97	49	.....	4,750.14	697.04	169.91	236.22	471.82	11.12	48.30	32.28

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	30.17	38.38	₱67.36	₱95.95	.....	.....	₱67.36
1919	395.11	95.90	936.26	237.10	.....	.....	936.26
1920	1,353.34	252.53	3,284.90	540.77	4	₱155.51	3,440.41
1921	2,965.18	118.59	6,869.74	279.80	5	195.86	7,065.60
1922	542.07	58.12	1,138.31	107.05	.....	.....	1,138.31
1923	567.44	.....	912.34	.....	.....	.....	912.34
Total	5,853.31	563.52	13,208.91	1,260.67	9	351.37	13,560.28

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous									
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	21	2	.....	646.01	348.50	834.95	891.36	2.32	.32	.....	3.97
1919	29	18	.....	1,462.59	2,675.09	2,085.54	1,649.77	150.92	1.27	.....	.....
1920	37	17	.....	1,884.59	1,627.28	2,712.55	814.77	94.31	8.81	7.71	4.35
1921	57	25	.....	3,527.98	2,072.85	1,889.22	558.58	200.07	9.09	2.65	7.44
1922	64	49	.....	3,964.20	3,191.21	1,005.82	570.65	285.33	61.59	10.39	10.29
1923	46	6	.....	5,728.12	1,952.15	2,698.09	636.32	31.48	11.07	.....	.....
Total	254	117	.....	17,213.49	11,867.08	11,226.17	5,121.45	764.43	92.15	20.75	26.05

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	2,720.82	6.61	₱3,418.41	₱8.27	3	₱87.64	₱3,506.05
1919	7,872.99	152.19	10,579.50	379.21	1	.....	10,579.50
1920	7,039.19	115.18	10,272.29	258.59	7	262.88	10,535.17
1921	8,048.63	219.25	14,096.74	520.18	7	725.68	14,822.42
1922	8,731.88	367.60	15,988.52	821.26	.....	.....	15,988.52
1923	11,014.68	42.55	20,264.78	96.31	5	113.70	20,378.48
Total	45,428.19	903.38	74,620.24	2,083.82	23	1,189.90	75,810.14

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

ANTIQUE

Year	Number of licenses			Forest product manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	6	.....	.....	40.53	9.85	23.80	76.05	.....	.....	.....	.....
1919	11	.....	.....	147.95	3.81	30.22	27.44	.....	.....	.....	.....
1920	11	.....	.....	739.43	432.33	270.81	236.26	.....	.....	.....	.....
1921	18	1	.....	962.56	216.36	285.75	64.84	3.40	.....	.....	1.25
1922	14	1	.....	292.61	27.99	45.02	57.59	2.29	.....	.....	.40
1923	8	.....	.....	43.23	6.23	6.32	8.88	.....	.....	.....	.....
Total	68	2	.....	2,226.31	696.57	664.92	471.06	5.69	.....	.....	1.65

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	153.23	.....	₱180.92	.....	.....	.....	₱180.92
1919	209.42	.....	419.53	.....	.....	.....	419.53
1920	1,678.83	.....	2,886.01	.....	.....	.....	2,886.01
1921	1,529.51	4.65	3,049.11	₱9.12	.....	.....	3,049.11
1922	423.21	2.69	847.37	5.93	.....	.....	847.37
1923	64.66	.....	128.18	.....	.....	.....	128.18
Total	4,058.86	7.34	7,511.12	15.05	.....	.....	7,511.12

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	81	1	.....	36.73	2,484.74	30,086.65	28,066.74	3.34	21.25	.....	1.95
1919	76	.....	.....	16.23	2,537.16	21,689.08	17,340.29	.....	.....	.....	.....
1920	78	1	.....	68.18	3,982.28	41,099.45	30,577.87	.....	.....	.....	.....
1921	82	.....	.....	41.99	1,442.67	5,630.59	8,944.68	.....	.....	.....	.....
1922	70	.....	.....	17.26	664.50	3,338.57	5,411.39	.....	.....	.....	.....
1923	55	.....	.....	243.08	785.72	2,498.57	4,780.11	.....	.....	.....	.....
Total	442	2	.....	423.47	11,897.07	104,342.91	95,121.08	3.34	21.25	.....	1.95

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	60,674.86	26.54	₱47,938.96	₱41.46	2	₱4.26	₱47,943.22
1919	41,582.76	.....	34,205.55	.....	18	595.48	34,801.03
1920	75,727.78	2.33	62,532.26	2.33	19	137.16	62,669.42
1921	16,059.93	.....	12,371.92	.....	18	142.84	12,514.76
1922	9,431.72	.....	6,084.17	.....	20	259.16	6,343.33
1923	8,307.48	.....	6,674.91	.....	19	145.85	6,820.76
Total	211,784.53	28.87	169,807.77	43.79	96	1,284.75	171,092.52

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

BATANGAS

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous									
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	10	.....	.....	29.05	8.57	18.64	54.89	.....	.....	.....	.....
1919	4	.....	.....	79.69	3.51	3.09	14.29	.....	.....	.....	.....
1920	11	2	.....	84.56	36.22	14.09	5.88	32.57	1.97	.....	.....
1921	15	.....	.....	116.32	48.04	13.39	26.72	.....	.....	.....	.....
1922	12	4	1	94.49	39.37	22.17	5.09	44.78	.87	.76	.....
1923	4	.....	.....	48.53	1.18	2.43	2.63	.....	.....	.....	.....
Total	56	6	1	452.64	136.89	73.81	107.50	77.35	2.84	.76	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	111.15	.....	₱121.58	.....	.....	.....	₱121.58
1919	100.58	.....	214.74	.....	1	₱.70	215.44
1920	140.75	34.54	282.76	₱84.39	1	7.88	290.64
1921	204.47	.....	389.61	.....	7	147.09	536.70
1922	161.12	46.41	320.01	114.02	2	4.55	324.56
1923	54.77	.....	126.85	.....	.....	.....	126.85
Total	772.84	80.95	1,455.55	198.41	11	160.22	1,615.77

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	15	4	.....	11.80	96.15	10.10	247.11	27.62	3.30	11.19	31.21
1919	13	13	.....	46.71	20.54	48.18	233.40	47.23	20.98	11.04	186.24
1920	14	24	.....	82.27	45.10	40.95	157.03	157.27	14.93	8.00	86.80
1921	27	62	.....	498.16	113.58	147.23	305.76	396.44	174.00	.....	33.66
1922	42	70	1	333.10	232.07	67.73	213.04	436.43	116.35	12.91	11.27
1923	25	4	.....	96.03	124.38	73.26	209.51	6.95	9.44	.....	.....
Total	136	177	1	1,068.07	631.82	387.45	1,365.85	1,071.94	339.00	43.14	349.18

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	365.16	73.32	₱307.38	₱100.79	.....	.....	₱307.38
1919	348.83	265.49	312.46	257.32	.....	.....	312.46
1920	325.35	267.00	392.79	466.97	.....	.....	392.79
1921	1,064.73	304.10	1,715.88	1,268.93	.....	.....	1,715.88
1922	845.94	576.96	1,355.10	1,284.14	.....	.....	1,355.10
1923	503.18	16.39	604.66	31.53	.....	.....	604.66
Total	3,453.19	1,803.26	4,688.27	3,409.68	.....	.....	4,688.27

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

BUKIDNON

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	1			11.87							
1919	1			17.05	5.03		23.40				
1920	2	1		137.76	15.77	5.01		11.54			4.70
1921	1			5.88		7.62	3.82				
1922											
1923	2			26.35							
Total	7	1		198.91	20.80	12.63	27.22	11.54			4.70

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	11.87		₱29.67				₱29.67
1919	45.48		61.87				61.87
1920	158.54	16.24	373.06	₱31.20			373.06
1921	17.32		24.23				24.23
1922							
1923	26.35		65.87				65.87
Total	259.56	16.24	554.70	31.20			554.70

Year	Number of licenses			Forest products manifested							
		Gratuitous		Ordinary timber				Gratuitous			
	Ordinary timber	Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	87	6	.....	193.59	676.38	904.14	3,620.18	25.14	.50	32.43	236.54
1919	73	5	.....	296.66	702.85	1,330.14	2,936.95	10.38	.....	22.13	18.24
1920	72	1	.....	783.24	577.07	1,834.85	2,978.77	3.73	.....	.....	.....
1921	90	5	.....	434.75	1,239.93	2,176.33	1,995.23	12.76	23.33	1.49	15.39
1922	100	4	.....	401.30	550.83	1,133.39	1,770.18	55.73	4.16	3.08	2.68
1923	57	.....	.....	576.04	473.93	945.86	1,210.86	.....	.....	.....	.....
Total	479	21	.....	2,685.58	4,220.99	8,324.71	14,512.17	107.74	27.99	59.13	272.85

Year	Total volume		Forest charges				Total ferest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	5,394.29	294.61	₱4,202.78	₱214.30	3	₱3.62	₱4,206.40
1919	5,266.60	50.75	4,595.02	57.20	25	271.71	4,866.73
1920	6,173.93	3.73	5,570.87	9.32	31	680.03	6,250.90
1921	5,846.24	52.97	6,120.71	76.08	6	13.31	6,134.02
1922	3,855.70	65.65	3,848.02	149.98	19	156.40	4,004.42
1923	3,206.69	.....	3,702.28	.....	.....	.....	3,702.28
Total	29,743.45	467.71	28,039.68	506.88	84	1,125.07	29,164.75

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

CAGAYAN

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	109	17	1	4,201.60	618.55	1,336.69	972.59	63.98	10.43	111.12	11.81
1919	139	39	.....	5,956.27	483.27	2,566.69	468.21	191.07	.20	6.23	45.33
1920	138	41	.....	6,903.11	651.19	3,170.28	565.68	201.29	21.12	17.29	157.20
1921	136	46	.....	4,737.00	592.17	2,400.00	725.27	210.13	41.79	88.11	2.95
1922	160	49	5	3,853.76	485.57	2,060.19	256.42	333.84	35.18	202.49	56.56
1923	159	20	2	5,912.24	579.66	1,791.34	641.82	33.12	10.84	90.63	4.70
Total	841	212	8	21,797.98	3,410.41	13,325.19	3,629.99	1,033.43	119.56	515.87	278.55

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	7,129.43	197.34	₱13,854.81	₱292.62	8	₱164.07	₱14,018.88
1919	9,474.44	242.83	18,416.37	506.87	8	71.10	18,487.47
1920	11,290.26	396.90	21,687.68	630.79	22	455.56	22,143.24
1921	8,454.44	342.98	15,493.39	677.59	21	404.70	15,898.09
1922	6,655.94	628.07	12,551.15	1,118.14	25	1,433.16	13,984.31
1923	8,925.06	139.29	17,762.34	192.04	22	1,398.63	19,160.97
Total	51,929.57	1,947.41	99,765.74	3,418.05	106	3,927.22	103,692.96

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous		First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
		Private	Public								
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	23	3	.....	116.21	177.72	1,359.18	715.94	4.77	8.50	11.04	.....
1919	29	3	.....	171.06	178.43	1,785.24	619.82	3.42	.....	4.50	1.91
1920	28	6	.....	204.23	205.07	1,510.46	355.33	38.15	7.72	10.18	.34
1921	25	2	.....	338.97	265.04	1,973.78	925.38	3.77	.....	.44	1.06
1922	26	2	.....	110.90	184.45	822.14	512.13	14.39	.....	.....	.....
1923	18	.....	.....	119.47	367.18	1,861.13	737.95	.....	.....	.....	.....
Total	149	16	.....	1,060.84	1,377.89	9,311.93	3,866.55	64.50	16.22	26.16	3.31

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	2,369.05	24.31	₱2,274.30	₱35.71	2	₱12.27	₱2,286.57
1919	2,754.55	9.83	2,790.44	14.00	8	731.61	3,522.05
1920	2,275.09	56.39	2,506.30	117.30	5	1,405.64	3,911.94
1921	3,503.17	5.27	4,131.35	10.39	4	13.49	4,144.84
1922	1,629.62	14.39	1,632.13	35.97	.....	.....	1,632.13
1923	3,085.73	.....	3,079.55	.....	.....	.....	3,079.55
Total	15,617.21	110.19	16,414.07	213.37	19	2,163.01	18,577.08

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

CAMARINES SUR

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	55	4	.....	380.39	1,676.45	3,594.10	3,414.56	1.14	16.66	2.51	.07
1919	54	3	.....	240.96	672.76	5,501.44	4,247.16	5.38	.....	3.50	.....
1920	62	1	.....	1,631.57	2,072.70	9,803.24	2,387.06	.....	.....	83.95	.....
1921	54	2	.....	591.97	963.55	1,618.15	753.00	6.46	9.12	6.18	.....
1922	66	6	.....	517.54	1,089.00	743.27	1,024.68	27.64	1.17	.20	.....
1923	52	.....	.....	547.18	875.43	947.43	737.55	.....	.....	.....	.....
Total	343	16	.....	3,909.61	7,349.89	22,207.63	12,564.01	40.62	26.95	96.34	.07

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	9,065.50	20.38	₱8,767.03	₱30.38	3	₱29.12	₱8,796.15
1919	10,662.32	8.88	9,236.56	16.95	5	147.34	9,383.90
1920	15,894.57	83.95	18,184.74	83.95	5	153.42	18,338.16
1921	3,926.67	21.76	4,919.90	36.01	6	.78	4,920.68
1922	3,374.49	29.01	4,183.00	71.05	8	21.45	4,204.45
1923	3,107.59	.....	3,997.30	.....	6	156.77	4,154.07
Total	46,031.14	163.98	49,288.53	238.34	33	508.88	49,797.41

CAPIZ

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous									
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	37	1	.....	51.49	17.44	94.41	687.52	5.14	.....	.....	.....
1919	66	3	.....	98.70	124.50	1,230.05	821.71	9.09	.....	.....	.....
1920	46	1	.....	89.53	153.33	1,777.68	931.00	12.16	.....	.....	.....
1921	69	1	.....	107.18	124.02	1,614.26	2,087.86	2.56	2.16	4.69	.77
1922	63	1	.....	83.30	87.49	323.90	2,780.21	7.67	.....	.....	.....
1923	49	.....	.....	126.96	59.58	463.07	2,216.69	.....	.....	.....	.....
Total	330	7	.....	557.16	566.36	5,503.37	9,524.99	36.62	2.16	4.69	.77

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	850.86	5.14	₱593.05	₱12.85	1	.....	₱593.05
1919	2,274.96	9.09	2,074.41	22.72	11	.....	2,074.41
1920	2,951.54	12.16	2,697.00	30.40	6	.....	2,697.00
1921	3,933.32	10.18	3,112.17	15.21	4	.....	3,112.17
1922	3,274.90	7.67	2,053.49	19.17	.....	.....	2,053.49
1923	2,866.30	.....	1,978.18	.....	.....	.....	1,978.18
Total	16,151.88	44.24	12,508.30	100.35	22	.....	12,508.30

CAVITE

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous									
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1921	2	.....	.....	.....	21.12	3.23	.....	.....	.....	.....	.....

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

CAVITE—Continued

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1921	24.35		₱34.91				₱34.91

CEBU

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous		First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
		Private	Public								
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	21	2	.....	33.40	75.79	61.91	543.40	2.32	.....	.....	.....
1919	22	3	.....	66.40	57.89	101.23	342.21	14.54	.....	.....	.....
1920	20	5	.....	41.93	61.00	36.61	159.52	38.48	1.80	.....	3.98
1921	36	6	.....	148.50	126.73	481.29	454.71	53.51	1.83	.....	3.61
1922	44	6	.....	187.87	97.72	184.02	233.14	23.13	6.76	.....	7.91
1923	35	.....	.....	143.74	76.07	156.84	123.40	.....	.....	.....	.....
Total	180	22	.....	621.84	495.20	1,021.90	1,856.38	131.98	10.39	.....	15.50

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	714.50	2.32	₱530.79	₱5.80	.....	.....	₱530.79
1919	567.73	14.54	530.17	36.35	.....	.....	530.17
1920	299.06	44.26	312.69	100.89	.....	.....	312.69
1921	1,211.23	58.95	1,269.99	138.32	11	.....	1,269.99
1922	702.75	37.80	916.84	71.92	2	.....	916.84
1923	500.05	.....	691.99	.....	.....	.....	691.99
Total	3,995.32	157.87	4,252.47	353.28	13	.....	4,252.47

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	4	.....	.....	1,850.33	2,245.93	146.08	3,086.14	.....	.....	.....	.....
1919	9	.....	.....	3,041.85	3,285.03	1,418.64	3,965.39	.....	.....	.....	.....
1920	12	.....	.....	4,076.85	4,946.14	1,228.63	1,723.98	.....	.....	.....	.....
1921	10	.....	.....	30.54	.....	118.25	436.44	.....	.....	.....	.....
1922	8	.....	.....	25.10	9.96	23.08	49.42	.....	.....	.....	.....
1923	5	.....	.....	143.47	5.89	15.18	22.74	.....	.....	.....	.....
Total	48	.....	.....	9,168.14	10,492.95	2,949.86	9,284.11	.....	.....	.....	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	7,328.48	.....	₱9,683.87	.....	.....	.....	₱9,683.87
1919	11,710.91	.....	15,933.50	.....	.....	.....	15,933.50
1920	11,975.60	.....	19,701.98	.....	.....	.....	19,701.98
1921	585.23	.....	412.82	.....	.....	.....	412.82
1922	107.56	.....	125.48	.....	.....	.....	125.48
1923	187.28	.....	394.06	.....	.....	.....	394.06
Total	31,895.06	.....	46,251.71	.....	.....	.....	46,251.71

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

DAVAO

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	20	.....	.....	277.51	18.72	168.03	253.88	.....	.....	.....	.....
1919	18	1	.....	277.92	87.96	92.04	125.96	.....	.....	.....	.....
1920	55	3	.....	346.51	407.11	356.58	847.96	44.58	.....	.....	.....
1921	49	23	.....	383.17	254.15	616.51	1,607.87	217.87	64.83	7.14	20.25
1922	46	15	.....	447.96	373.09	819.03	573.24	114.69	39.49	225.54	2.34
1923	34	.....	.....	280.22	309.95	625.95	478.83	.....	.....	.....	.....
Total	222	42	.....	2,013.29	1,450.98	2,678.14	3,887.74	377.14	104.32	232.68	22.59

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	718.14	.....	₱1,016.82	.....	1	₱6.91	₱1,023.73
1919	583.88	.....	981.76	.....	.....	.....	981.76
1920	1,958.16	44.58	2,257.50	.....	12	4,597.20	6,854.70
1921	2,861.70	310.09	2,759.59	.....	2	.....	2,759.59
1922	2,213.32	382.06	2,785.18	₱572.67	3	168.74	2,953.92
1923	1,694.95	.....	2,030.84	.....	.....	.....	2,030.84
Total	10,030.15	736.73	11,831.69	572.67	18	4,772.85	16,604.54

Year	Number of licenses			Forest products manifested							
		Gratuitous		Ordinary timber				Gratuitous			
	Ordinary timber	Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	33	4	.....	157.90	109.10	95.53	188.81	16.21	.24	1.36	.....
1919	35	4	.....	186.33	306.14	152.68	184.37	49.93	36.91	14.88	15.77
1920	53	7	.....	400.44	427.87	361.11	367.79	33.82	.....	.....	3.43
1921	60	6	.....	624.29	508.54	367.39	311.57	26.31	.....	.....	.....
1922	75	18	.....	421.04	445.91	399.35	150.28	65.55	2.58	.....	.....
1923	65	6	.....	487.76	645.22	423.85	130.30	16.42	2.30	1.96	1.14
Total	261	45	.....	2,277.76	2,441.78	1,799.91	1,333.12	208.24	42.03	18.20	20.34

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	551.34	17.86	₱648.33	₱42.37	4	₱6.83	₱655.16
1919	829.52	117.49	1,169.90	202.90	1	.....	1,169.90
1920	1,557.21	37.25	2,187.91	86.26	3	.....	2,187.91
1921	1,811.79	26.31	2,846.71	65.77	8	44.03	2,890.74
1922	1,416.58	85.70	2,195.95	185.31	2	3.78	2,199.73
1923	1,687.13	21.82	2,675.73	47.03	3	9.00	2,684.73
Total	7,853.57	306.43	11,724.53	429.64	21	63.64	11,788.17

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

ILOCOS SUR

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous									
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	23	2	.....	91.89	23.87	6.86	45.35	7.59	.....	.....	.....
1919	38	6	.....	192.99	32.68	13.68	39.57	26.11	2.71	.....	.....
1920	41	6	.....	164.65	34.13	17.78	35.47	28.22	2.05	.....	.....
1921	46	6	.....	192.57	95.41	74.92	80.69	14.43	.....	.....	.....
1922	53	23	.....	246.08	36.65	32.41	42.61	98.25	.84	.....	.....
1923	49	.....	.....	227.85	44.80	53.99	58.88	.....	.....	.....	.....
Total	250	43	.....	1,116.03	267.54	199.64	302.57	174.60	5.60	.....	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	167.97	7.59	₱291.94	₱18.97	1	₱1.51	₱293.45
1919	278.92	28.82	564.96	69.34	.....	.....	564.96
1920	252.03	30.27	498.34	77.95	.....	.....	498.34
1921	443.59	14.43	739.85	36.08	.....	.....	739.85
1922	357.75	99.09	723.89	246.88	1	7.22	731.11
1923	385.52	.....	720.25	.....	.....	.....	720.25
Total	1,885.77	180.20	3,539.23	449.22	2	8.73	3,547.96

Year	Number of licenses			Forest products manifested							
		Gratuitous		Ordinary timber				Gratuitous			
	Ordinary timber	Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	25	.....	.....	76.69	24.59	63.46	582.05	.....	.....	.....	.....
1919	21	1	.....	78.59	73.60	155.09	315.51	15.26	.....	.....	.....
1920	27	.....	.....	277.47	482.85	318.44	631.76	.....	.....	.....	.....
1921	41	.....	.....	330.44	707.15	464.49	555.10	.....	.....	.....	.....
1922	46	.....	.....	211.35	194.82	137.36	221.78	.....	.....	.....	.....
1923	18	.....	.....	139.68	75.88	25.89	43.38	.....	.....	.....	.....
Total	178	1	.....	1,114.22	1,558.89	1,164.73	2,349.58	15.26	.....	.....	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	746.79	.....	₱583.09	.....	1	₱12.84	₱595.93
1919	622.79	15.26	619.72	.....	1	.....	619.72
1920	1,710.52	.....	2,052.27	.....	2	.....	2,052.27
1921	2,057.18	.....	2,629.16	.....	2	.....	2,629.16
1922	765.31	.....	1,068.85	.....	.....	.....	1,068.85
1923	284.83	.....	518.60	.....	1	.....	518.60
Total	6,187.42	15.26	7,471.69	.....	7	12.84	7,484.53

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

ISABELA

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	76	14	4	765.79	573.79	243.78	254.08	117.05	2.98	21.68	1.57
1919	76	13	3	1,679.12	966.80	893.94	692.34	52.41	9.77	21.25	8.49
1920	72	32	2	1,481.70	772.62	1,733.97	455.67	236.32	50.26	27.71	2.61
1921	88	32	4	1,392.93	871.65	922.44	588.08	174.45	112.75	46.12	94.62
1922	139	72	5	1,540.25	986.71	667.21	108.07	419.86	250.45	41.83	36.24
1923	95	11	1	1,649.22	1,116.34	735.36	374.51	57.42	33.66	2.75	7.28
Total	546	175	19	8,509.01	5,287.91	5,196.70	2,472.75	1,057.51	459.87	161.34	150.83

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	1,837.44	150.28	₱3,145.98	₱330.06	3	₱6.98	₱3,152.96
1919	4,232.20	91.92	6,888.11	171.17	.....	4.00	6,892.11
1920	4,443.96	316.90	6,824.98	695.21	1	190.36	7,015.34
1921	3,775.10	427.94	6,006.28	698.68	8	15.57	6,021.85
1922	3,302.24	748.38	6,051.93	1,485.28	7	1,270.23	7,322.16
1923	3,875.43	101.11	6,740.17	200.43	29	.....	6,740.17
Total	21,466.37	1,836.53	35,657.45	3,580.83	48	1,487.14	37,144.59

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	54	.....	.....	12.25	201.19	275.15	1,078.61	.....	.....	.....	.....
1919	53	.....	.....	9.10	316.03	1,460.27	600.55	.....	.....	.....	.....
1920	71	.....	.....	56.19	402.90	2,596.04	501.41	.....	.....	.....	.....
1921	65	.....	.....	37.75	602.76	1,602.47	833.54	.....	.....	.....	.....
1922	53	.....	.....	30.86	396.42	993.85	467.76	.....	.....	.69	.....
1923	36	.....	.....	21.96	316.81	1,056.63	497.04	.....	.....	.....	.....
Total	332	.....	.....	168.11	2,236.11	7,884.41	3,978.91	.....	.....	.69	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	1,567.20	.....	₱1,146.86	.....	10	₱559.94	₱1,706.80
1919	2,385.95	.....	2,257.34	.....	2	28.23	2,285.57
1920	3,556.54	.....	3,591.57	.....	20	226.10	3,817.67
1921	3,076.52	.....	3,017.75	.....	16	157.93	3,175.68
1922	1,888.89	.69	1,899.51	.....	9	366.84	2,266.35
1923	1,892.44	.....	1,835.26	.....	1	138.46	1,973.72
Total	14,367.54	.69	13,748.29	.....	58	1,477.50	15,225.79

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

LANAO

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	1										
1919											
1920	2			2.54	24.24	191.93	22.37				
1921	3			9.05	35.48	102.27	27.06				
1922	5	1	1	3.76	31.69	94.72	66.58	3.19		4.27	
1923	3			18.76	67.10	25.50	52.78				
Total	14	1	1	34.11	158.51	414.42	168.79	3.19		4.27	

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918							
1919							
1920	241.08		₱245.82				₱245.82
1921	173.86		191.64				191.64
1922	196.75	7.46	184.94	₱12.25			184.94
1923			199.44				199.44
Total	611.69	7.46	821.84	12.25			821.84

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous									
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	30	4	.....	113.33	50.71	27.69	21.90	16.94	.....	.....	.....
1919	28	.....	.....	140.11	83.44	40.96	21.62	.....	.....	.....	.....
1920	22	.....	.....	88.70	73.75	14.71	15.49	.....	.....	.....	.....
1921	31	3	.....	141.11	75.16	38.86	88.84	4.48	.....	.....	.....
1922	62	5	.....	198.54	68.40	47.16	65.28	25.36	.....	.....	2.51
1923	32	1	.....	152.25	68.09	35.14	39.88	5.93	.....	.....	.....
Total	205	13	.....	834.04	419.55	204.52	253.01	52.71	.....	.....	2.51

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	213.63	16.94	₱398.03	.....	.....	.....	₱398.03
1919	286.13	.....	527.20	.....	.....	.....	527.20
1920	192.65	.....	354.83	.....	.....	.....	354.83
1921	343.97	.....	548.79	₱13.31	1	.....	548.79
1922	379.38	2.51	678.75	64.65	.....	.....	678.75
1923	295.36	5.93	537.84	14.82	4	₱43.95	581.79
Total	1,711.12	25.38	3,045.44	92.78	5	43.95	3,089.39

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

LEYTE

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	102	18	7	513.67	192.70	808.12	3,448.05	226.99	3.29	41.33	15.61
1919	101	55	.....	835.68	583.36	1,850.76	3,079.09	465.10	20.60	70.39	11.64
1920	115	59	3	1,422.47	484.89	2,751.36	2,169.26	487.49	51.36	38.93	.44
1921	121	180	.....	1,551.35	447.88	4,521.70	2,139.88	1,281.03	21.33	39.61	65.63
1922	141	266	5	1,298.56	326.55	3,201.96	933.03	2,109.89	68.28	51.95	8.91
1923	97	54	.....	1,626.90	378.07	4,015.41	1,314.79	322.60	5.99	12.23	11.93
Total	677	632	15	7,248.63	2,413.45	17,149.21	13,084.10	3,892.10	170.85	254.44	114.16

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	4,962.54	287.22	₱4,105.38	₱21.56	9	₱153.35	₱4,258.73
1919	6,348.89	567.73	6,354.55	1,269.86	7	208.12	8,562.67
1920	6,827.98	578.22	6,119.51	1,334.92	12	523.61	6,643.12
1921	8,660.81	1,407.69	10,141.84	3,307.01	9	1,319.51	11,461.41
1922	5,760.10	2,239.03	7,404.71	5,433.56	13	590.94	7,995.65
1923	7,335.17	352.75	9,307.17	833.69	5	295.48	9,602.65
Total	39,895.49	5,432.55	43,433.16	12,800.60	55	3,091.07	46,524.23

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	5	1	.....	21.75	40.83	48.29	36.03	18.09	.....	.....	.....
1919	9	1	.....	25.74	57.95	46.12	42.53	2.53	.....	.....	.....
1920	13	.....	.....	66.72	96.77	65.36	16.23	.....	.....	.....	.....
1921	11	.....	.....	89.08	190.52	108.97	78.42	.....	.....	.....	.....
1922	15	.....	.....	91.33	134.89	61.08	120.02	.....	.....	.....	.....
1923	9	.....	.....	34.99	42.72	18.85	98.19	.....	.....	.....	.....
Total	62	2	.....	329.61	563.68	348.67	391.42	20.62	.....	.....	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	146.90	18.09	₱181.92	₱45.23	.....	.....	₱181.92
1919	172.34	2.53	218.66	6.32	3	₱20.24	238.90
1920	245.08	.....	285.43	.....	1	2.70	288.13
1921	466.99	.....	656.66	.....	.....	.....	656.66
1922	407.32	.....	551.75	.....	.....	.....	551.75
1923	194.75	.....	219.50	.....	.....	.....	219.50
Total	1,633.38	20.62	2,113.92	51.55	4	22.94	2,136.86

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

MASBATE

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	53	6	.....	1,541.34	978.17	224.46	1,768.27	39.72	8.05	174.31	305.80
1919	51	4	.....	3,320.46	1,145.32	387.88	2,100.60	9.33	17.66	87.96	450.02
1920	62	6	.....	8,760.58	2,697.17	1,255.05	2,208.20	56.72	26.30	77.72	29.85
1921	66	6	.....	9,429.50	3,071.10	1,824.27	2,702.74	19.12	2.15	.....	274.66
1922	76	5	.....	9,727.78	470.48	553.01	2,304.76	49.82	2.07	1.68	1.52
1923	49	.....	.....	7,605.40	960.97	876.20	1,575.36	.....	.....	.....	.....
Total	357	27	.....	40,385.06	9,323.21	5,120.87	12,659.93	174.71	56.23	341.67	1,061.85

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	4,512.24	527.88	₱6,429.20	₱438.58	.....	.....	₱6,429.20
1919	6,954.26	564.97	11,457.31	362.78	.....	.....	11,457.31
1920	14,921.00	190.59	28,306.36	273.89	2	.....	28,306.36
1921	17,027.61	295.93	31,356.04	188.35	5	.....	31,356.04
1922	13,056.03	55.09	26,720.56	130.09	.....	.....	26,720.56
1923	11,017.93	.....	22,118.83	.....	.....	.....	22,118.83
Total	67,489.07	1,634.46	126,388.30	1,393.69	7	.....	126,388.30

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous		First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
		Private	Public								
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	62	6	.....	1,343.15	4,336.60	1,173.67	2,567.00	25.57	.....	.....	.....
1919	70	5	.....	2,847.95	5,002.35	1,769.65	1,473.27	35.21	.....	.....	.....
1920	83	1	.....	3,316.12	5,162.21	2,576.00	1,595.99	1.55	.25	.....	.....
1921	94	2	.....	1,888.82	3,809.29	1,772.85	4,112.92	18.75	42.83	.....	.....
1922	107	5	.....	2,568.08	3,474.52	970.03	2,206.48	16.83	6.50	.....	.....
1923	71	1	.....	2,515.49	2,163.97	418.86	2,868.90	29.56	.....	1.66	.....
Total	487	20	.....	14,479.61	23,948.94	8,681.06	14,824.56	127.47	49.58	1.66	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	9,420.42	27.29	₱12,319.94	₱64.65	6	₱196.48	₱12,516.42
1919	11,093.22	35.21	17,129.68	88.03	4	243.31	17,372.99
1920	12,650.32	1.80	19,407.61	4.25	5	139.86	19,547.47
1921	11,583.88	18.75	14,265.29	46.88	8	145.54	14,410.83
1922	9,219.11	16.83	13,705.25	42.07	5	160.11	13,865.36
1923	7,937.22	29.56	11,387.99	73.90	1	114.99	11,502.98
Total	61,934.17	129.44	88,215.76	319.78	29	1,000.29	89,216.05

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

MISAMIS

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	24	3	.....	106.68	55.84	2.55	109.64	28.47	.....	.....	.....
1919	22	6	1	110.09	98.05	81.26	146.64	135.92	.....	.....	17.54
1920	16	11	.....	200.07	102.84	175.79	78.98	108.77	.....	.....	2.54
1921	21	13	.....	132.76	48.66	218.99	193.19	94.86	10.00	.....	.....
1922	37	25	.....	229.77	59.51	758.06	485.17	178.19	4.12	6.49	3.53
1923	31	8	.....	139.26	7.10	286.96	239.23	52.61	.....	2.88	.89
Total	151	66	1	918.63	430.00	1,523.61	1,252.85	598.82	14.12	9.37	24.50

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	274.71	28.47	₱407.83	₱71.17	.....	.....	₱407.83
1919	436.04	153.46	576.88	348.57	.....	.....	576.88
1920	557.68	111.31	869.71	273.19	.....	.....	869.71
1921	593.60	104.86	720.47	252.05	1	₱14.61	735.08
1922	1,532.51	192.33	1,664.39	459.91	.....	.....	1,664.39
1923	732.55	56.38	855.37	134.90	3	132.09	987.46
Total	4,127.09	646.81	5,094.65	1,539.79	4	146.70	5,241.35

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous		First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
		Private	Public								
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	17	1	.....	309.38	99.33	56.06	4,546.89	.....	.....	.....	49.12
1919	23	1	.....	737.60	139.36	2,456.10	1,181.32	.....	.....	.....	72.93
1920	28	1	.....	710.62	217.09	4,421.38	5.30	.....	.....	.....	10.51
1921	36	.....	.....	851.36	357.45	1,192.14	.67	.....	.....	.....	.....
1922	53	.....	.....	510.30	236.97	2,169.52	6.16	.....	.....	.....	.....
1923	41	.....	.....	780.59	282.27	1,270.47	22.11	.....	.....	.....	.....
Total	198	3	.....	3,899.85	1,332.47	11,565.67	5,762.45	.....	.....	.....	132.56

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	5,011.66	49.12	₱3,251.95	₱24.56	.....	.....	₱3,251.95
1919	4,514.38	72.93	5,099.80	36.46	4	₱470.16	5,569.96
1920	5,354.39	10.51	6,526.22	5.25	3	491.31	7,017.53
1921	2,401.62	.....	3,857.05	.....	2	234.00	4,091.05
1922	2,922.95	.....	3,803.80	.....	1	4.86	3,808.66
1923	2,355.44	.....	3,656.35	.....	7	801.44	4,457.79
Total	22,560.44	132.56	26,195.17	66.27	17	2,001.77	28,196.94

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

NUEVA ECIJA

Year	Number of licenses			Forest products manifested							
		Gratuitous		Ordinary timber				Gratuitous			
	Ordinary timber	Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	22	.....	.....	205.30	126.91	23.02	23.46	.....	.....	.....	.....
1919	31	2	.....	335.26	245.75	73.13	130.46	21.36	.....	.....	.....
1920	25	2	.....	483.69	637.84	31.74	43.55	15.14	.....	.....	.....
1921	28	17	.....	786.82	620.24	48.57	75.06	285.69	42.83	1.66	.....
1922	34	15	.....	532.72	351.17	50.93	60.18	110.20	6.50	.....	.....
1923	28	.....	.....	745.47	549.11	200.52	345.47	.....	.....	.....	.....
Total	168	36	.....	3,089.26	2,531.02	427.91	678.18	432.39	49.33	1.66	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	378.69	.....	₱728.36	.....	1	₱4.62	₱732.98
1919	784.60	21.36	1,345.13	₱53.40	1	44.77	1,389.90
1920	1,196.82	15.14	2,219.50	37.85	3	47.71	2,267.21
1921	1,530.69	330.18	2,983.51	780.13	4	86.52	3,070.03
1922	995.00	116.70	1,939.57	285.25	3	18.45	1,958.02
1923	1,840.57	.....	3,060.58	.....	5	32.78	3,093.36
Total	6,726.37	483.38	12,276.65	1,156.63	17	234.85	12,511.50

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	9	.....	.....	63.71	6.47	1.96	.95	.....	.....	.....	.....
1919	.....	3	.....	35.85	3.58	1.90	.....	11.93	.....	1.28	2.02
1920	23	3	.....	37.43	1.91	24.36	33.52	25.70	.....	1.28	.....
1921	22	20	1	173.31	26.72	15.96	8.51	108.24	90.69	43.32	23.90
1922	42	15	2	229.88	101.80	49.99	16.89	175.55	118.71	34.12	17.11
1923	40	2	.....	300.34	72.95	54.65	21.52	12.21	.....	.....	.....
Total	142	43	3	840.52	213.43	148.82	81.40	333.73	209.40	80.00	43.03

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	73.09	.....	₱171.41	.....	2	.....	₱171.41
1919	41.33	15.23	96.89	₱32.12	.....	.....	96.89
1920	97.23	2o.98	137.56	65.53	7	.....	137.56
1921	224.50	266.15	493.57	461.90	4	₱11.80	505.37
1922	398.56	345.49	785.84	659.86	8	29.13	814.97
1923	449.46	12.21	925.68	30.53	5	.....	925.68
Total	1,284.17	666.06	2,610.95	1,249.94	26	40.93	2,651.88

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

OCCIDENTAL NEGROS

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	55	.....	.....	577.71	544.62	14,917.61	51,914.58	.....	.....	.....	.....
1919	65	2	.....	2,165.38	1,058.60	20,962.69	32,206.13	2.10	4.39	2.53	.....
1920	67	.....	.....	2,257.53	1,867.42	38,813.77	21,152.76	.....	.....	.....	.....
1921	67	3	.....	2,262.01	2,136.64	1,933.58	3,514.95	39.69	.....	.....	.....
1922	79	1	.....	1,005.05	696.64	635.43	1,294.53	3.68	.....	.....	.....
1923	63	.....	.....	1,832.18	1,336.42	471.36	1,702.30	.....	.....	.....	.....
Total	396	6	.....	10,099.86	7,639.84	77,734.67	111,785.25	45.47	4.39	2.53	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	67,954.52	.....	₱43,136.10	.....	.....	.....	₱43,136.10
1919	56,392.50	8.92	44,066.56	₱14.36	8	₱1,218.35	45,284.91
1920	64,091.48	.....	57,835.10	.....	9	790.78	58,625.88
1921	9,847.18	39.69	10,551.04	74.22	4	411.34	10,962.38
1922	3,631.68	3.68	4,840.31	9.20	4	1,385.26	6,225.57
1923	5,342.26	.....	7,907.59	.....	2	3.73	7,911.32
Total	207,259.62	52.29	168,336.70	97.78	27	3,809.46	172,146.16

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	16	.....	.....	70.78	107.59	66.47	153.56	.....	.....	.....	.....
1919	17	.....	.....	402.86	461.06	406.68	300.94	.....	.....	.....	.....
1920	16	.....	.....	877.47	639.60	311.45	380.92	.....	.....	.....	.....
1921	16	2	.....	801.07	445.74	261.23	792.26	19.00	3.54	.....	.....
1922	26	6	.....	395.30	325.92	190.63	294.19	106.54	.....	6.37	.....
1923	19	2	.....	244.57	477.20	175.60	88.30	10.79	.....	.....	.....
Total	110	10	.....	2,792.05	2,457.11	1,412.06	2,010.17	136.33	3.54	6.37	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	398.40	.....	₱481.58	.....	.....	.....	₱481.58
1919	1,571.54	.....	2,255.89	.....	.....	.....	2,255.89
1920	2,209.44	.....	2,654.98	.....	1	₱18.13	2,673.11
192	2,300.80	22.54	3,328.64	₱52.81	.....	.....	3,328.64
1922	1,206.04	112.91	1,814.85	267.72	3	74.62	1,889.47
1923	985.67	10.79	1,546.97	26.98	3	66.85	1,613.82
Total	8,671.89	143.24	12,082.91	347.51	7	159.60	12,242.51

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

PALAWAN

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	33	3	.....	10,578.19	2,108.37	.....	135.37	14.32	.....	.....	1.87
1919	36	1	.....	16,394.79	1,317.04	231.16	202.91	4.49	.....	.....	.....
1920	55	1	.....	22,694.44	2,398.29	225.33	562.05	3.10	.....	.....	.....
1921	54	2	.....	24,055.01	333.32	24.15	135.99	28.56	.....	2.15	3.92
1922	77	.....	.....	31,205.83	341.27	42.46	58.51	.....	.....	.....	.....
1923	53	.....	.....	23,688.81	1,012.35	88.41	22.74	.....	.....	.....	.....
Total	308	7	.....	128,617.07	7,510.64	611.51	1,117.57	50.47	.....	2.15	5.79

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	12,821.93	16.19	₱29,675.72	₱36.73	9	₱286.79	₱29,962.51
1919	18,145.90	4.49	43,295.15	11.22	13	3,925.60	47,220.75
1920	25,880.11	3.10	60,839.94	7.75	9	469.83	61,309.77
1921	24,548.47	34.63	60,729.65	75.51	14	728.83	61,458.48
1922	31,648.07	.....	78,558.19	.....	4	125.09	78,723.28
1923	24,812.41	.....	62,215.33	.....	9	889.85	63,105.18
Total	137,856.89	58.41	335,353.98	131.21	58	6,425.99	341,779.97

Year	Number of licenses			Forest products manifested							
				Ordinary timber				Gratuitous			
	Ordinary timber	Gratuitous									
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	12	.....	.....	64.93	192.18	832.56	325.41	.....	.....	.....	.....
1919	18	6	.....	115.52	266.08	586.89	356.60	.....	71.53	40.55	.....
1920	23	2	.....	35.18	594.86	878.86	430.12	.....	7.71	.....	2.25
1921	22	1	.....	173.53	773.28	1,096.73	3,147.28	.....	.19	.....	8.45
1922	25	.....	.....	6.49	138.96	228.95	653.36	.....	.....	.....	.....
1923	13	.....	.....	8.08	171.77	197.47	171.91	.....	.....	.....	.....
Total	113	9	.....	403.73	2,137.13	3,821.46	5,084.68	.....	79.43	40.55	10.70

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	1,415.08	.....	₱1,445.87	.....	.....	.....	₱1,445.87
1919	1,325.09	112.08	1,453.11	₱147.85	.....	.....	1,453.11
1920	1,939.02	9.96	2,073.96	12.70	6	₱94.66	2,168.62
1921	5,190.82	8.64	4,264.12	4.52	4	355.43	4,619.55
1922	1,027.76	.....	780.30	.....	.....	.....	780.30
1923	549.23	.....	561.29	.....	.....	.....	561.29
Total	11,447.00	130.68	10,578.65	165.07	10	450.09	11,028.74

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

PANGASINAN

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	99	8	3	940.04	1,560.14	1,664.92	1,205.40	64.56	1.16	.....	.74
1919	102	10	5	889.15	1,660.81	2,669.24	898.85	126.65	2.13	25.55	29.95
1920	115	28	1	1,915.54	2,807.84	2,915.23	944.45	368.47	23.60	.....	.....
1921	116	71	3	2,130.90	2,609.32	2,094.53	1,308.31	628.10	21.34	7.97	3.45
1922	165	60	7	2,197.50	2,769.55	1,360.14	623.64	455.17	48.74	80.12	.16
1923	100	8	1	1,844.65	2,186.86	1,413.11	439.36	106.49	4.55	.92	1.38
Total	697	185	20	9,917.78	13,594.52	12,117.17	5,420.01	1,749.44	101.82	114.56	35.68

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	5,370.50	66.46	₱6,957.93	₱163.51	.....	.....	₱6,957.93
1919	6,118.05	184.28	7,832.81	360.34	12	₱160.28	7,993.09
1920	8,583.06	392.07	12,388.07	956.57	12	429.43	12,817.50
1921	8,142.06	661.16	11,989.92	1,612.10	26	684.95	12,624.87
1922	6,950.83	584.19	11,320.04	1,339.97	37	818.68	12,138.72
1923	5,883.98	113.34	9,524.70	274.66	34	820.22	10,344.92
Total	41,048.48	2,001.50	60,013.47	4,707.15	121	2,863.56	62,877.03

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	20	1	.....	15.25	66.92	48.47	391.03	.94	.....	.....	.....
1919	23	1	.....	19.76	45.81	35.40	644.17	.94	.....	.....	.....
1920	20	.....	.....	23.13	67.83	34.27	243.16	.....	.....	.....	.....
1921	25	.....	.....	62.67	124.77	65.02	396.08	.....	.....	.....	.....
1922	15	.....	1	20.09	53.67	12.98	90.60	.....	3.88	1.20	6.32
1923	10	.....	.....	21.13	47.04	5.71	62.83	.....	.....	.....	.....
Total	113	2	1	162.02	406.04	201.85	1,827.87	1.88	3.88	1.20	6.32

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	521.67	.94	₱382.50	₱2.35	.....	.....	₱382.50
1919	745.14	.94	475.61	2.35	2	₱24.47	500.08
1920	368.39	.....	315.43	.....	2	9.98	325.41
1921	648.54	.....	606.90	.....	2	5.70	612.60
1922	177.34	11.40	192.02	10.18	.....	.....	192.02
1923	136.70	.....	160.49	.....	.....	.....	160.49
Total	2,597.78	13.28	2,132.95	14.88	6	40.15	2,173.10

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

ROMBLON

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu, m.*	*Cu. m.*	*Cu. m.*
1918	8	1	.....	18.91	13.14	133.64	1,501.37	2.90	.....	.....	.....
1919	9	2	.....	87.83	48.94	67.86	33.21	.....	.....	.....	.....
1920	12	5	.....	603.57	433.06	48.65	48.40	16.37	.....	.....	.....
1921	20	19	.....	874.50	5,454.57	298.13	3.24	166.83	11.74	.....	.....
1922	22	9	.....	204.82	354.50	306.21	19.34	67.11	2.26	.....	.....
1923	10	1	.....	28.57	107.96	167.75	22.64	25.69	.....	4.67	.....
Total	81	37	.....	1,818.20	6,412.17	1,022.24	1,628.20	278.90	14.00	4.67	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	1,667.06	2.90	₱951.25	₱7.25	.....	.....	₱951.25
1919	237.84	17.56	377.45	.....	.....	.....	377.45
1920	1,133.68	16.37	2,281.36	40.93	4	₱212.02	2,493.38
1921	6,630.44	178.57	10,667.85	434.79	1	29.20	10,697.05
1922	884.87	69.37	1,359.68	171.16	.....	.....	1,359.68
1923	326.92	30.36	412.44	68.89	.....	.....	412.44
Total	10,880.81	315.13	16,050.03	722.92	5	241.22	16,291.25

Year	Number of licenses			Forest products manifested							
		Gratuitous		Ordinary timber				Gratuitous			
	Ordinary timber	Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	67	8	1	278.68	606.08	629.85	981.83	52.00	.....	.....	.79
1919	26	17	1	612.37	467.94	1,300.30	974.50	351.02	2.75	.96	.....
1920	107	69	.....	1,440.48	509.17	1,099.05	703.80	699.39	13.36	19.05	4.86
1921	132	69	5	2,535.74	657.37	2,717.56	2,275.59	524.17	235.24	81.31	13.76
1922	185	187	3	773.29	536.10	2,110.80	743.55	1,515.49	167.40	155.57	18.23
1923	119	34	2	1,641.64	671.91	1,652.06	632.40	165.62	51.65	.....	4.59
Total	636	384	12	7,282.20	3,448.57	9,509.62	6,311.07	3,307.69	470.40	256.89	42.23

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	2,496.44	52.79	₱2,721.59	₱130.39	4	₱91.82	₱2,813.41
1919	3,355.11	354.73	4,020.39	882.64	1	33.21	4,053.60
1920	3,752.50	736.66	5,815.91	1,789.99	2	30.95	5,846.86
1921	8,186.26	854.48	11,180.76	1,750.76	14	2,844.23	14,024.99
1922	4,163.74	1,856.69	5,219.95	4,204.51	16	1,102.58	6,322.53
1923	4,598.01	221.86	7,080.22	513.01	6	669.33	7,749.55
Total	26,552.06	4,077.21	36,038.82	9,271.30	43	4,772.12	40,810.94

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

SORSOGON

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	46	1	.....	454.99	482.52	545.48	1,600.13	1.22	.....	.....	.....
1919	36	.....	.....	564.29	7,829.94	528.99	1,371.23	.....	.....	.....	.....
1920	56	.....	.....	3,129.15	791.13	1,108.09	1,447.17	.....	.....	.....	.....
1921	56	.....	.....	7,175.71	837.52	875.04	1,735.56	.....	.....	.....	.....
1922	60	3	.....	8,121.96	685.63	439.09	1,187.39	30.56	38.52	3.52	.....
1923	37	.....	1	3,240.33	674.48	549.81	1,177.84	3.38	.....	.....	.....
Total	291	4	1	22,686.43	11,301.22	4,046.50	8,519.32	35.16	38.52	3.52	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	3,083.12	1.22	₱3,206.80	₱3.05	.....	.....	₱3,206.80
1919	10,294.45	.....	3,799.74	.....	.....	.....	3,799.74
1920	6,475.54	.....	10,841.19	.....	4	₱233.20	11,074.39
1921	10,623.83	.....	20,938.37	.....	3	113.43	21,051.80
1922	10,434.07	72.60	22,366.13	137.70	1	.....	22,366.13
1923	5,642.46	3.38	10,259.27	8.48	.....	.....	10,259.27
Total	46,553.47	77.20	71,411.50	146.18	7	346.63	71,758.13

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	2	.....	.....	846.25	120.75	.....	71.80	.....	.....	.....	.....
1919	5	.....	.....	1,863.57	898.28	313.11	570.96	.....	.....	.....	.....
1920	7	.....	.....	5,041.01	1,780.18	987.98	348.54	.....	.....	.....	.....
1921	6	.....	.....	2,415.68	413.06	863.91	422.74	.....	.....	.....	.....
1922	7	.....	.....	4,819.64	384.01	906.24	58.05	.....	.....	.....	.....
1923	3	.....	.....	1,348.65	.....	82.15	51.08	.....	.....	.....	.....
Total	30	.....	.....	16,334.80	3,596.28	3,153.39	1,523.17	.....	.....	.....	.....

Year	Total volume		Forest charges				Total forest charges
	Ordianry timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	1,038.80	.....	₱2,332.65	.....	.....	.....	₱2,332.65
1919	3,645.92	.....	6,604.94	.....	.....	.....	6,604.94
1920	8,157.71	.....	17,335.05	.....	.....	.....	17,335.05
1921	4,115.39	.....	7,734.07	.....	.....	.....	7,734.07
1922	6,167.94	.....	13,560.39	.....	.....	.....	13,560.39
1923	1,481.88	.....	3,479.32	.....	.....	.....	3,479.32
Total	24,607.64	.....	51,046.42	.....	.....	.....	51,046.42

TABLE No. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

SURIGAO

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	20	4	.....	201.43	19.68	45.70	49.82	38.48	25.30	.....	.....
1919	26	2	.....	154.80	68.50	499.68	39.61	4.66	49.90	.....	.....
1920	26	33	6	177.57	189.26	375.36	86.33	397.76	129.86	25.55	26.91
1921	47	59	5	566.77	116.78	61.91	15.81	321.34	65.43	50.97	6.27
1922	52	101	1	594.58	478.17	827.34	762.15	524.55	61.95	1.92	14.30
1923	45	5	.....	543.13	64.98	207.70	261.26	36.81	22.55	.....	.....
Total	216	204	12	2,238.28	937.37	2,017.69	1,214.98	1,323.60	354.99	78.44	47.48

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	316.63	63.78	₱603.71	₱134.15	.....	.....	₱603.71
1919	762.59	54.56	1,009.24	86.50	.....	.....	1,009.24
1920	828.52	580.08	1,145.35	1,228.10	.....	.....	1,145.35
1921	761.27	444.01	1,661.91	1,215.61	2	.....	1,661.91
1922	2,662.24	602.72	3,412.13	1,413.58	4	.....	3,412.13
1923	1,077.07	59.36	1,793.63	125.85	3	.....	1,793.63
Total	6,408.32	1,804.51	9,625.97	4,203.79	9	.....	9,625.97

TARLAC

Year	Number of licenses			Forest products manifested							
		Gratuitous		Ordinary timber				Gratuitous			
	Ordinary timber	Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	10			46.89	53.41	78.88	68.62				
1919	13	27		104.11	63.67	26.89	37.87	63.08			1.24
1920	15	5		439.04	99.52	31.19	75.39	11.22			
1921	16	54		271.64	101.18	29.15	46.40	141.18	2.38	1.42	1.50
1922	17	40		114.83	66.78	85.76	15.48	53.94	2.16	6.13	.48
1923	10	1		51.01	74.91	12.16	11.24	5.80			
Total	81	127		1,027.52	459.47	264.03	255.00	275.22	4.54	7.55	3.22

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	247.80		₱310.53				₱310.53
1919	232.54	64.32	401.61	₱158.32			401.61
1920	645.14	11.22	800.52	38.05			800.52
1921	448.37	146.48	883.22	359.69	3	₱39.78	923.00
1922	282.85	62.71	480.75	144.46	3	24.57	505.32
1923	149.32	5.80	257.67	14.50	4	106.02	363.69
Total	2,005.02	299.50	3,134.30	715.02	10	170.37	3,304.67

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

TAYABAS

Year	Number of licenses			Forest products manifested							
		Gratuitous		Ordinary timber				Gratuitous			
	Ordinary timber	Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	143	9	.....	12,620.93	3,580.26	4,830.63	1,806.50	26.56	3.40	4.43	.....
1919	153	15	.....	17,538.74	1,797.62	6,301.19	2,412.33	.....	.....	.....	.....
1920	171	11	.....	21,683.54	2,097.83	24,333.32	2,925.99	.....	.....	.....	.....
1921	180	11	.....	13,073.51	2,352.30	3,197.49	1,826.69	14.37	1.43	.....	.....
1922	194	11	.....	8,848.78	1,257.15	1,078.38	1,549.14	82.17	.....	.....	.....
1923	132	1	.....	13,097.56	1,059.70	886.78	1,246.54	4.19	.....	.....	.....
Total	973	58	.....	86,863.06	13,144.26	40,627.79	11,697.19	127.29	4.83	4.43	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	22,838.32	34.39	₱42,656.61	₱75.93	9	₱188.60	₱42,840.21
1919	27,949.28	69.65	54,049.74	173.88	22	571.61	54,621.35
1920	50,040.68	50.01	76,715.99	120.72	20	321.88	77,037.87
1921	20,449.99	15.80	40,323.07	38.07	26	753.98	41,077.05
1922	12,733.45	82.17	25,860.63	205.43	2	101.27	25,961.90
1923	16,290.58	4.19	35,843.50	10.48	14	858.78	36,702.28
Total	150,302.30	216.21	275,449.54	624.51	93	2,796.12	278,245.65

Year	Number of licenses			Forest products manifested							
	Ordinary timber	Gratuitous		Ordinary timber				Gratuitous			
		Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu, m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	37	3	1	290.70	555.31	1,689.42	595.03	138.41	.....	.....	.....
1919	42	8	1	231.08	659.81	3,259.47	958.57	165.22	.....	.....	.....
1920	49	14	2	318.17	1,741.07	6,546.91	3,789.64	186.97	4.90	.....	.....
1921	48	40	2	415.29	1,290.35	2,064.71	1,339.51	381.20	15.29	2.73	.....
1922	64	85	1	451.05	933.80	624.16	914.46	481.87	50.75	12.59	.....
1923	44	10	1	496.33	633.49	664.21	474.09	24.36	3.34	21.80	.....
Total	284	150	8	2.202.62	5,813.83	14,848.88	8,071,30	1,378.03	74.28	37.12	.....

Year	Total volume		Forest charges				Total forest charges
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	
	Cu. m.	*Cu. m.*					
1918	3,130.46	.....	₱3,546.65	₱346.62	1	₱6.49	₱3,553.14
1919	5,108.93	.....	5,306.17	413.65	.....	.....	5,306.17
1920	12,395.79	191.87	11,848.76	474.77	16	256.29	12,105.05
1921	5,109.86	492.71	5,708.21	1,212.39	7	107.60	5,815.81
1922	2,923.47	545.21	3,609.71	1,293.39	1	18.95	3,628.65
1923	2,268.15	49.50	3,102.31	87.71	14	232.58	3,334.89
Total	30.936.66	1,107.29	33.121.81	3,827.33	39	621.91	33.743.72

TABLE NO. 12.—*Statements showing the utilization of timber by licenses from public forest in the different provinces of the Philippine Islands from 1918 to 1923, inclusive*—Continued

ZAMBOANGA

Year	Number of licenses			Forest products manifested							
		Gratuitous		Ordinary timber				Gratuitous			
	Ordinary timber	Private	Public	First group	Second group	Third group	Fourth group	First group	Second group	Third group	Fourth group
	Cu. m.	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*	*Cu. m.*
1918	33	7	.....	247.30	172.88	838.43	3,250.01	42.50	8.64	.....	6.89
1919	30	14	.....	539.04	70.79	801.77	417.83	.....	7.45	.....	.....
1920	49	32	.....	1,575.17	864.63	3,377.66	1,390.95	.....	14.78	45.81	132.15
1921	39	44	.....	2,524.80	695.07	2,044.08	1,884.47	496.51	15.19	11.76	7.98
1922	33	40	.....	1,744.70	457.47	788.31	158.66	456.68	6.79	3.97	1.18
1923	30	18	.....	567.34	239.81	517.26	167.97	134.73	.....	.....	.....
Total	214	155	.....	7,198.35	2,500.65	8,367.51	7,269.89	1,130.42	52.35	61.54	148.20

Year	Total volume		Forest charges				
	Ordinary timber	Gratuitous	Ordinary timber	Gratuitous	Number of violations	Additional charges	Total forest charges
	Cu. m.	*Cu. m.*					
1918	4,508.62	58.03	₱3,341.01	₱122.66	1	₱30.55	₱3,371.56
1919	1,829.43	7.45	2,464.48	338.73	.....	.....	2,464.48
1920	7,208.41	192.74	1,308.02	672.39	2	257.35	11,565.37
1921	7,148.42	531.44	10,340.93	1,279.82	4	1,291.61	11,632.54
1922	3,149.14	468.62	5,915.60	1,156.45	.....	.....	5,915.60
1923	1,492.38	134.73	2,379.32	336.83	1	.....	2,379.32
Total	25,336.40	1,393.01	35,749.36	3,906.88	8	1,579.51	37,328.87

TABLE No. 12-A.—*Statements covering forest violations detected by the personnel under the division of licenses from January to November, 1924, inclusive*

Districts	Licenses		Nonlicenses		Ill.-Caingins		Total		Total number of days		Cost		
	Amount of forest products	Amount of forest charges	Amount of forest products	Amount of forest charges	Amount of forest products	Amount of forest charges	Amount of forest products	Amount of forest charges	Field	Office	Salary	Expenses	Total
I	1,727.28	₱4,750.52	620.17	₱2,894.27	704.14	₱1,354.59	3,051.59	₱9,299.38	799	1,313¾	₱4,858.95	₱1,444.45	₱6,303.40
II	369.73	1,403.69	250.34	1,698.54	5,694.10	7,016.88	6,313.17	10,119.11	450	577¾	2,763.50	1,003.99	3,767.49
III									1,629¾	974½	3,845.02	730.43	4,575.45
IV	967.07	2,164.08	173.92	704.96	815.14	1,544.38	1,956.13	4,413.42	789¼	1,101	4,348.50	1,263.87	5,612.37
V	589.13	1,203.74	768.37	2,727.24	3,919.87	7,184.88	5,277.37	11,115.86	1,415¼	1,919¼	7,662.12	1,803.89	9,466.01
VI	1,032.61	1,283.83	483.98	898.12	7,354.57	11,190.39	8,871.16	13,372.34	1,045½	2,111¾	9,055.23	2,390.32	11,445.55
VII	1,413.77	1,081.08	1,520.39	2,473.86	15,150.53	21,754.38	18,084.69	25,309.32	1,179¾	1,554½	5,911.83	1,944.60	7,856.43
VIII	1,096.58	1,089.24	1,137.85	2,063.76	176.27	304.00	2,410.70	3,457.00	853¼	1,232	5,969.71	2,239.30	8,209.01
IX									388	559	2,541.90	814.98	3,356.88
X	1,813.45	2,863.03	1,282.35	1,289.49	12,718.78	24,888.00	15,814.58	29,040.52	1,370¾	2,301½	8,032.36	2,864.61	10,896.97
XI	6,545.31	6,084.27	1,272.96	2,080.87	644.24	1,382.01	8,462.51	9,547.15	1,018	1,980½	6,299.51	1,393.32	7,692.82
XII	82.27	243.61	49.67	318.56	159.37	452.14	291.31	1,014.31	173	389¼	1,706.18	564.17	2,270.35
XIII	746.16	1,732.16	1,370.65	3,760.53	20,063.66	26,167.08	22,180.47	31,659.77	997¼	1,560½	6,450.19	1,995.28	8,445.47
Total	16,382.36	23,899.25	8,930.65	20,910.20	67,400.67	103,538.73	92,713.68	148,348.18	11,508½	17,536½	69,445.00	20,453.21	89,898.21
Manila office:													
Licenses									169	3,549½	13,816.87	264.37	14,081.24
Special Permit									6¾	294	1,252.33	6.25	1,258.58
Caingins									4¾	125½	291.11	42.56	333.67
Total									180½	3,969	15,360.31	313.18	15,673.49
Grand total	16,382.36	23,899.25	8,930.65	20,910.20	67,400.67	103,538.73	92,713.68	148,348.18	11,689	21,505½	84,805.31	20,766.39	105,571.70

TABLE NO. 13.—*Statement showing the quantity and value of minor forest products exported during the fiscal year 1924 (January 1 to December 31)*

	Kilos	Value
Copal (almaciga):		
United States	339,998	P83,978
United Kingdom	49,596	18,542
France	200	860
Germany	42,313	10,840
British East Indies	93,071	25,662
Japan	215,398	59,154
Australia	3,063	476
Total	743,639	199,512
Elemi (pili resin):		
United States	763	384
United Kingdom	848	254
Germany	59,136	21,197
Japan	971	370
Total	61,718	22,205
Gutta-percha:		
British East Indies	12,812	12,400
Total	12,812	12,400
Rubber:		
United States	30,205	28,755
British East Indies	67,700	81,500
Total	97,905	110,255
Lumbang (candle nut) oil:		
United States	65	35
Total	65	35
Sapan wood (sibukao):		
China	101,200	1,995
Total	101,200	1,995
Grand total		346,402

TABLE NO. 14.—*Revenue derived from the sale of forest products and expenditures of the Bureau of Forestry since its organization, April 14, 1900*

Fiscal year	Revenue	Expenses	Surplus	Expenses
				Per cent
1901 to 1906[a]	P2,268,591	P1,118,887	P1,149,704	49
1907	191,080	105,050	85,030	55
1908	211,571	107,242	104,329	51
1909	251,380	115,049	136,331	45
1910	271,582	152,161	119,421	56
1911	334,763	160,476	174,287	48
1912	354,685	200,840	153,845	57
1913[a]	390,664	227,048	163,616	59
1913 (July 1 to December 31)	160,913	141,131	19,782	88
1914	442,661	256,990	185,671	58
1915	425,817	274,176	151,641	64
1916	494,447	285,708	208,739	58
1917	533,328	281,126	255,202	53
1918	650,692	334,254	316,438	51
1919	805,229	473,242	331,986	58
1920	1,009,879	541,488	468,390	54
1921	1,013,151	524,921	488,230	51
1922	949,279	486,846	462,432	51
1923	1,062,437	515,211	547,225	48
1924	1,277,799	544,045	733,754	42
Total	13,102,948	6,845,891	6,257,053	55

[a] Up to 1913, the fiscal year was from July 1 to June 30.

TABLE NO. 15.—*Lumber production with relation to population*

Fiscal year	Population	Production in board feet	
		Total	Per capita
1903	7,635,426	36,615,000	4.8
1918	10,314,310	105,286,000	10.2
1919	10,551,539	136,486,000	12.9
1920	10,794,223	152,957,000	14.3
1921	11,042,490	180,277,000	16.3
1922	11,296,467	173,615,000	15.7
1923	11,556,286	182,066,000	15.8
1924	11,787,411	260,535,600	22.1

TABLE NO. 16.—*Comparative statements of lumber and timber exported and imported to and from the Philippines*

Year	Exported			
	Board feet	Value in pesos[a]	Differences in board feet	Per cent of increase and decrease
1903	None	None		
1918	7,080,376	650,796		
1919	6,813,256	805,427	— 267,120	— 3.7
1920	13,862,256	1,834,297	— 7,049,000	+103.4
1921	11,790,168	1,574,664	— 2,012,088	— 15.5
1922	18,285,000	1,667,940	— 6,494,832	+ 57.6
1923	36,949,904	3,057,907	—18,664,904	+102.7
1924	50,759,584	4,083,690	—13,809,680	+ 37.34

Year	Imported			
	Board feet	Value in pesos	Differences in board feet	Per cent of increase and decrease
1903	7,632,000			
1918	6,393,496	468,119	—1,238,504	— 16.2
1919	6,000,448	592,059	— 393,048	— 6.2
1920	7,838,912	761,930	—1,838,464	+ 30.6
1921	10,820,680	937,543	—2,981,768	+ 38
1922	1,831,680	116,863	—8,989,000	— 83
1923	2,070,816		— 239,136	+ 13.05
1924	4,670,784	491,700	—2,599,968	+125.55

[a] Customs declaration value.

TABLE NO. 17.—*Relations between revenues, expenditures, and surplus derived from sale of forest products*

Fiscal year	Revenues		Expenditures		Surplus	
	Total	Per capita	Total	Per capita	Total	Per capita
1903	₱527,415	₱0.068	₱211,647	₱0.028	₱315,768	₱0.041
1918	650,692	0.063	384,254	0.037	315,438	0.031
1919	805,229	0.076	473,242	0.045	381,989	0.036
1920	1,009,879	0.093	541,488	0.050	468,391	0.043
1921	1,013,151	0.092	516,422	0.047	496,729	0.045
1922	949,280	0.083	486,847	0.043	462,433	0.041
1923	1,062,437	0.092	515,211	0.044	547,225	0.047
1924	1,277,799	0.108	544,045	0.046	733,754	0.062

TABLE NO. 18.—*Statement of appropriation and expenditures, Bureau of Forestry (January 1 to December 31, 1924)*

Appropriation:		
Act No. 3123		₱548,412.00
Equipment carried forward from 1923		864.55
Emergency Board Resolutions Nos. 17, 18, 23, 30, 38, 42, 53, 65, 68, 73, 76, 87, and 101		6,313.79
Total		555,590.34
Expenditures:		
Salaries and wages	₱395,769.76	
Traveling expenses of personnel	77,210.64	
Freight, express, and delivery service	3,004.96	
Postal, telegraph, and cable service	8,552.37	
Illumination and power service	4,199.39	
Miscellaneous service	1,349.45	
Rental of buildings and grounds	9,700.00	
Consumption of supplies and materials	34,500.00	
Printing and binding report	3,500.00	
Traveling expenses of persons not government employees	600.00	
Maintenance and repair	1,945.00	
Furniture and office equipment	3,713.47	
Total expenditures		544,045.04
Balances, January 1, 1925		11,545.30
Statement of the Bureau of Forestry appropriation, expenditures, and revenues for the fiscal year, 1924:		
Appropriation		555,590.34
Revenue and other collections		1,277,799.05
Expenditures		544,045.04
Surplus		733,754.01
Percentage of expenditures to revenue		43%

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF FORESTRY

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For the Fiscal Year Ended December 31, 1924

ARTHUR F. FISCHER
Director of Forestry

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